



## NETWORKING AND REMOTE DIAGNOSTICS

### ADVANTAGE® Model Endoscope Reprocessor



Endoscope reprocessing the way it should be™

**MEDIVATORS®**



# NETWORKING AND REMOTE DIAGNOSTICS

## ADVANTAGE<sup>®</sup> Model Endoscope Reprocessor

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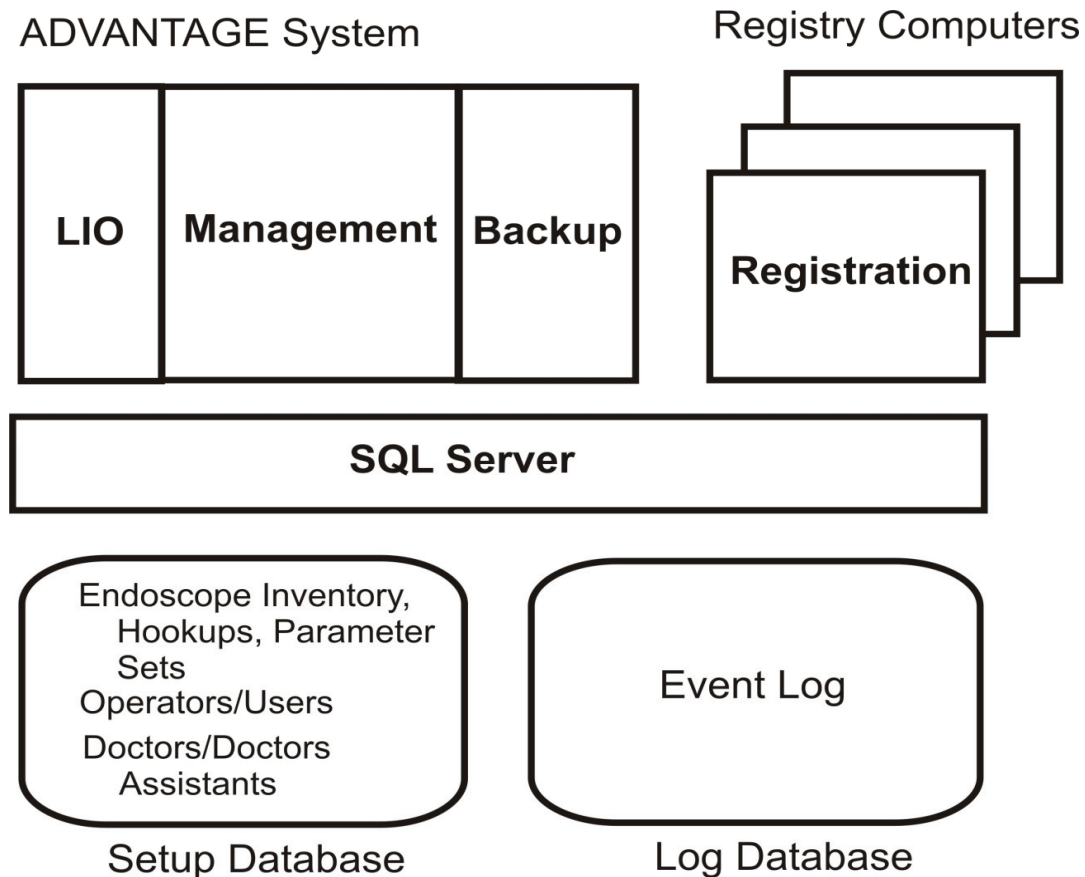


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### Software Components



The ADVANTAGE System software is built upon the Windows XP platform. All features of Windows XP are available including an SQL Server. This platform allows configuring the ADVANTAGE System to support centralized administration.

The SQL server allows implementing a number of features like logging and storage of all cycle data, automatic back-ups, software upgrades, remote connectivity, and network connection and administration. Each ADVANTAGE Endoscope Reprocessor has the capability of storing all cycle data information on its own mirrored hard drives. No special setup is required for this configuration. Utilizing the networking feature of the SQL Server, a common set of databases can be maintained for all ADVANTAGE systems. This allows administration of the system from a single server where all systems utilize the same databases.

The ADVANTAGE System is HIPPA compliant. No patient information is maintained on the ADVANTAGE System - only the patient ID.



### Major Software Components

**LIO** – The Logic Input/Output application is the real time module that performs the endoscope reprocessing cycle.

**Management** – is the ADVANTAGE administration tool. Endoscope inventory, their type and cycle parameters are maintained using Management. Operators, doctors and assistant are also entered. Management is the software that reads the database of cycle logs.

**Registration** – is the procedure room module allows selection of a reprocessed endoscope and entry of patient, doctor and assistant information. This ensures that an endoscope is taken out of service and only becomes available once it is reprocessed.

**Print Service** -- Allows automatic printing of each cycle log to the default printer.

**SQL Server** – is Microsoft SQL Server 2008 Express. It is used to access the Setup Database and Log Database. A major feature is that the SQL Server can be accessed over a network.

**Setup Database** – the SQL Database contains the endoscope inventory, hookups and parameter sets (cycle parameters). Operators, users, doctors and doctor's assistance are maintained in this database.

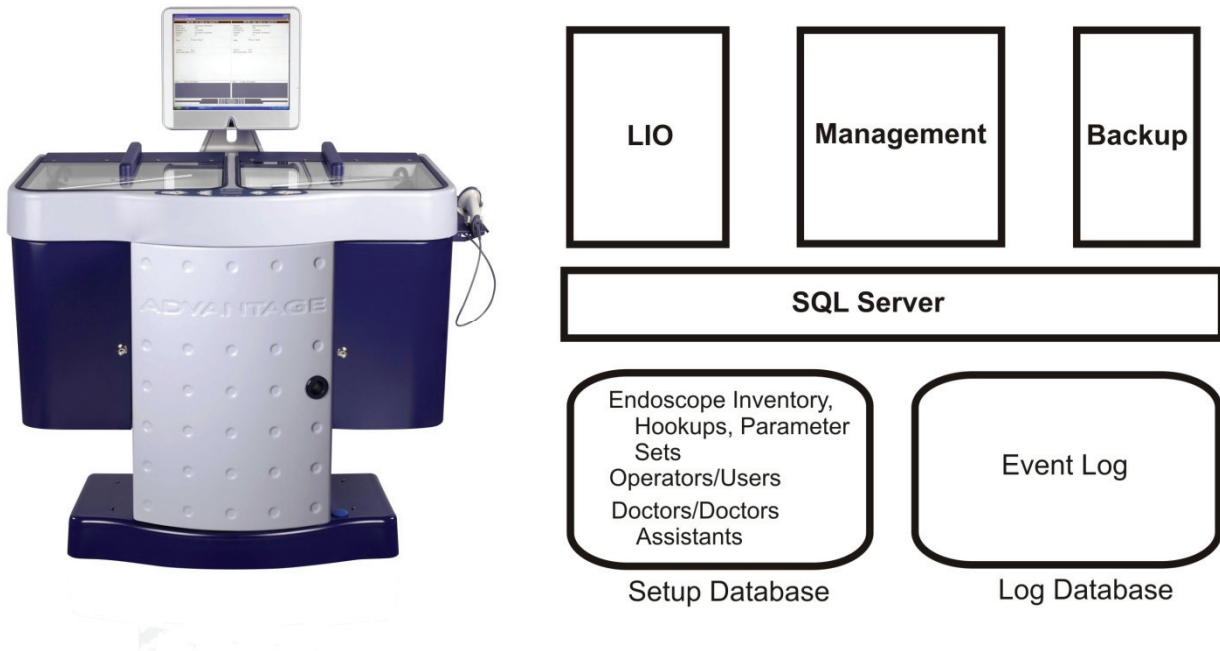
**Log Database** – is the event Log Database. Each reprocessing cycle and its results are maintained in this database. Fluid changes and their log numbers are recorded. Water line disinfection cycles are also recorded.



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### ADVANTAGE Stand-alone System



The ADVANTAGE Endoscope Reprocessor is installed with all system software modules needed to run reprocessing cycles and store cycle data logs. Each unit includes two databases-- the Setup Database and Log Database which need to be maintained. For multiple Standalone Systems, the databases must be maintained for each system.

### ADVANTAGE Internet Connectivity

The ADVANTAGE computer is a standard PC utilizing the Microsoft Windows XP operating system and therefore, the ADVANTAGE can be connected to the internet, which is a requirement for remote diagnostics. There are two methods of connecting the ADVANTAGE to the internet-- connecting to the facility's system network via an Ethernet cable or to a wireless network via a Wireless USB Adapter. Please see the Local Networking Hardware Components section for a detailed description of each method. Each facility must determine the connection method appropriate for their requirements. Setting up an internet connection will require input from the facility's IT department.



### ADVANTAGE Networking

ADVANTAGE systems can be networked to provide an internet connection to the ADVANTAGE system or to support multiple ADVANTAGE units with a centralized database. A centralized database system eliminates the redundancy found in separate standalone database systems by allowing: single point-of-entry and storage of new endoscopes or operators (not separately for each unit), software upgrades pushed to each unit, and centralized cycle data logs for quick and easy reporting on all ADVANTAGE units.

The ADVANTAGE system is capable of being networked in two ways:

1. Local Network
  - a. with one ADVANTAGE unit becoming the Server PC
  - b. with a desktop computer becoming the Server PC
2. Secure Server Network

Please note that once a network is created, the cycle data logs and endoscope and operator lists are stored in the centralized database. They are no longer stored in the stand-alone ADVANTAGE unit hard drives. The Management software on the ADVANTAGE unit can be configured to read the database files regardless of what type of network is created.



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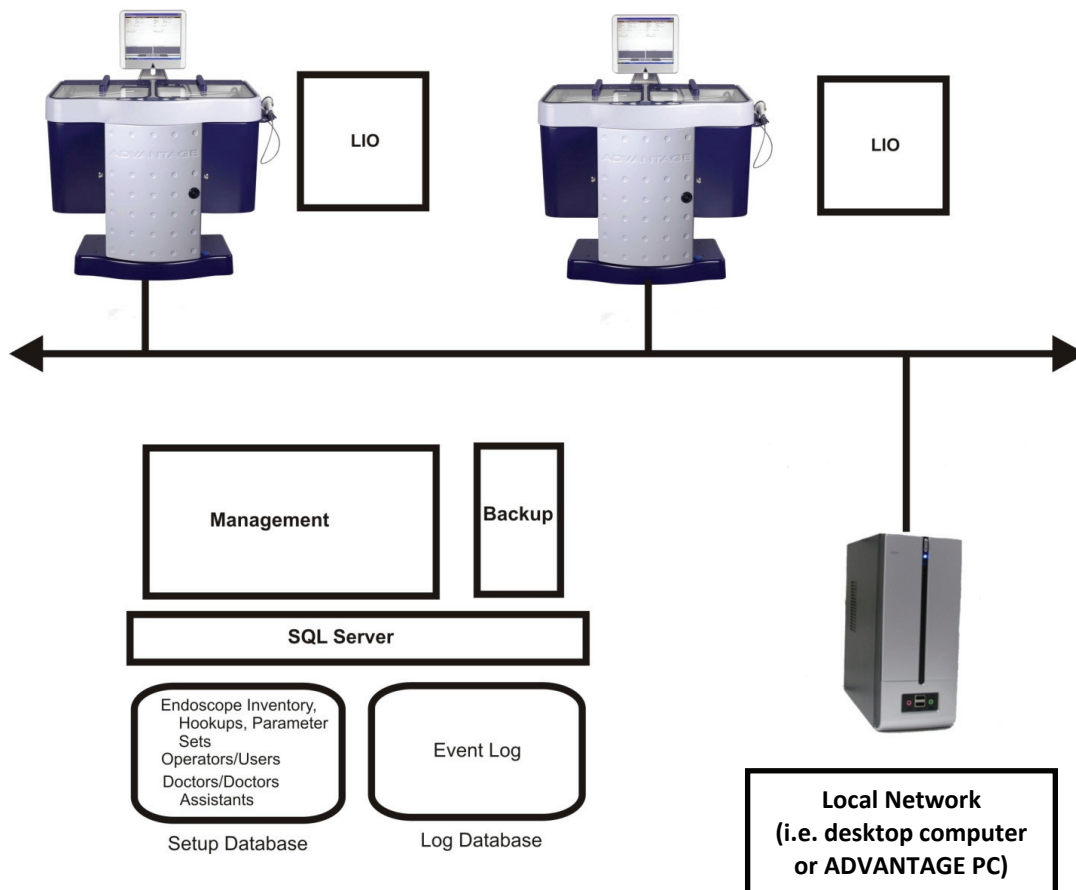
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### ADVANTAGE Network Configurations

There are two types of network configurations compatible with the ADVANTAGE: Local Network or Secure Server.

#### Local Network with ADVANTAGE unit or Desktop Computer as the Server PC

A local server may be built from either a desktop computer or an ADVANTAGE computer. The local server is called the Server PC. The other ADVANTAGE units are considered Clients of the Server PC. The Server PC runs the Services and Management applications and contains the ADVANTAGE database where all parameters and cycle results are stored. The Clients run the LIO and Print Service applications. In this way, each ADVANTAGE unit (Client) is independently initiated and executes the Disinfection, Recovery or Waterline Disinfect programs with the cycle results being printed to its dedicated receipt printer, while all access to management and administrative functions (parameters, users, cycle logs, etc.) is possible through the one Server PC.





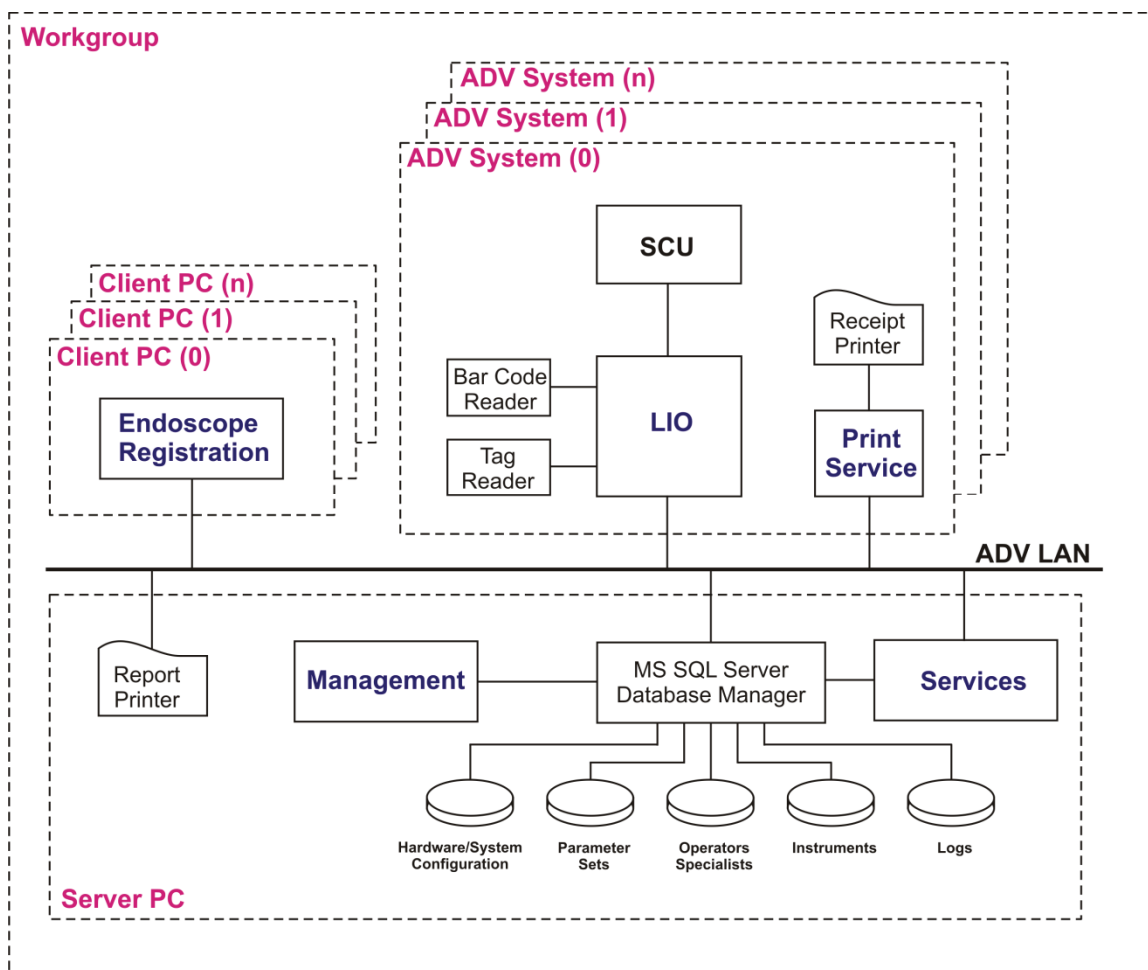


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In this configuration, LIO is installed on all ADVANTAGE systems. Management, backup, SQL server and the databases are installed on the Server PC.

To create a network of ADVANTAGE units, each unit (Client) and the Server PC must be connected to a hub and assigned a unique IP address. In addition, a unique Workgroup must be created and each Client and the Server PC must be configured to belong to this Workgroup. Once the Workgroup has been established, the appropriate applications of the ADVANTAGE PC software are loaded on each unit, starting with the Server PC. During the install, when asked for the SQL Server Host name or the Services Address each unit should enter the computer name of the Server PC. Finally, each Client should allow the ADV folder, where the ADVANTAGE executable applications reside, to be "shared". All these changes can be done through the Control Panel of each unit.





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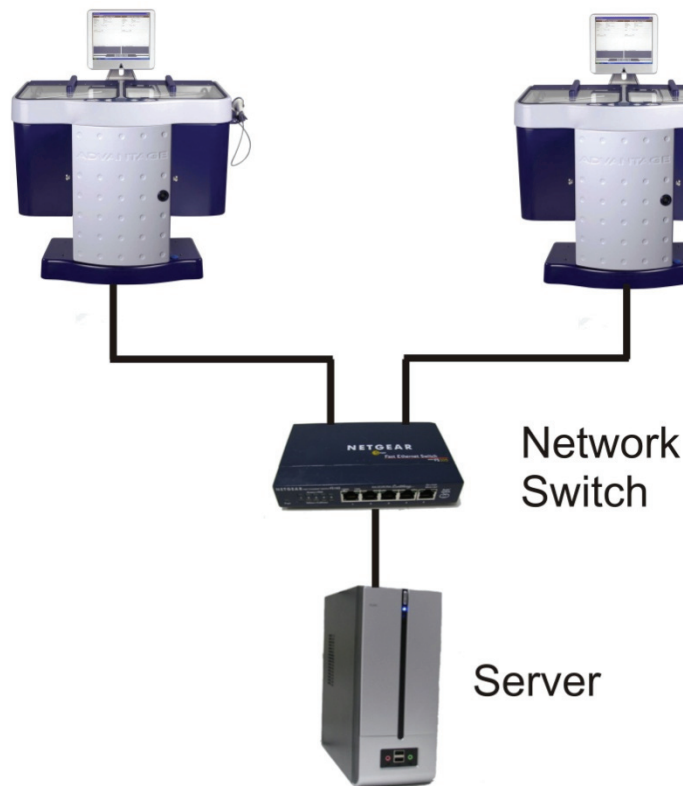
## ADVANTAGE<sup>®</sup> Model Endoscope Reprocessor

### Create Local Network

There are two ways to build a local network: hardwired or wireless.

#### A. Hardwired Network

A stand-alone hardwired network is easily created using a network switch or hub. This allows interconnecting the network cables. The server name is configured in each ADVANTAGE system. The SQL server resides on the local server or Server PC.



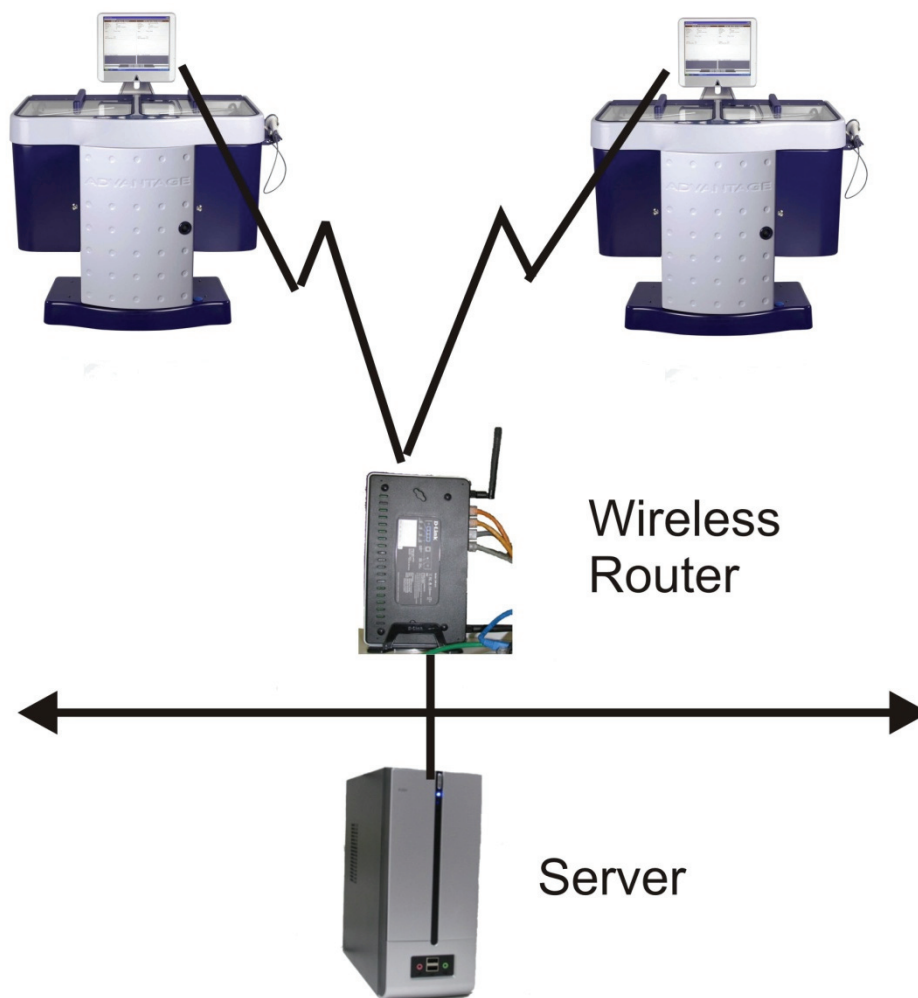


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### B. Wireless Network

The ADVANTAGE system can easily be configured with a USB wireless network adapter to connect to a wireless router. This allows networking the ADVANTAGE systems without installing network cables. However, the server must be hardwired to the router. Access to the routers may encounter request delays to the server if a wireless connection is used.





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### Local Networking Hardware Components

There are several methods for connecting the ADVANTAGE system to a facility's network. The basic protocol for local area networks is the Ethernet protocol. Networking components are designed to meet the Ethernet standards including hardwired cabling and wireless protocols. Follows is a description of physical connection methods.

#### Category 5 Network Cable

The standard Ethernet cable is the Category 5 network cable. This cable is used to hardwire network components such as PCs, HUBs and routers. The cable is used to hardwire ADVANTAGE systems to a network.



#### Network Switch or HUB

The network switch or HUB allows connecting multiple networking components such as PCs, HUBs and routers. It is not intelligent and does no routing. The switch can be connected to a larger hardwired network.



#### USB Wireless Adapter

Using a wireless router allows an ADVANTAGE system to be connected to a network and server without a hardwired network. The following picture is a LINKSYS USB Adapter by CISCO. The adapter is installed in the ADVANTAGE PC or for the ADVANTAGE 2.0 in the Modular PC. A driver, supplied with the adapter, must be installed.



The wireless standards are 802.11. There are a number of them. When selecting wireless networking components, make sure the wireless adapter is supported by wireless router. 802.11n is the latest standard.

Not all wireless components support the 802.11n standard.

On the ADVANTAGE 2.0, install the USB wireless adapter in the USB connectors on the PC Module as shown.





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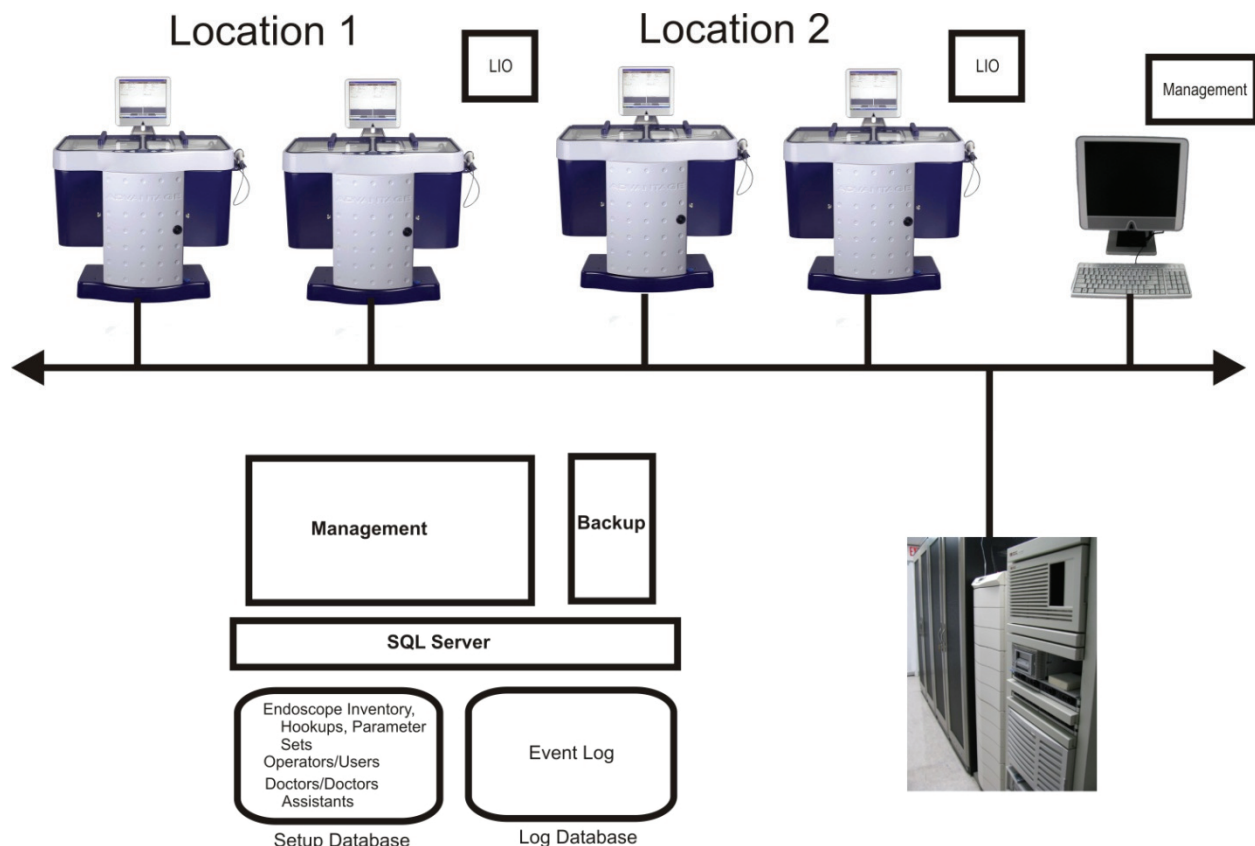
### Wireless Adapter Router

A wireless router provides the interface to the network. The USB Wireless Adapter communicates to network through the wireless router. The router routes the network messages, Ethernet messages, to the correct network component. The following picture is of the latest CISCO System router. The router is open showing the cable connections.



### Secure Server Network

ADVANTAGE systems can be networked to support multiple reprocessing centers at a single location or multiple locations. This configuration is the same as for the local server configuration but now utilizes the facility's network and secured server. The advantage of this configuration is that it provides centralized databases and can be maintained by the facility's IT department.





### Setting up a Secure Server Network

Customers have the ability to save the Advantage reprocessing cycle data logs to a server. For facilities with multiple ADVANTAGE Systems, it is beneficial to set up the ADVANTAGE Systems on a network so that endoscope and operator administration can be executed from a single location and data cycle logs for all units can be stored in one location. Once the network is set up, these cycle data logs can then be viewed by multiple people from their desktop computer.

In order for the ADVANTAGE System data files to be saved onto a secure server, certain programs need to be installed on the server so the ADVANTAGE can communicate with the Server.

1. Install patches onto networked server
2. Install Microsoft SQL Server 2008 Express Application onto Network Server
3. Install ADVANTAGE Management Application and ADV Services Application onto Network Server
4. Set-up ADVANTAGE System on Network Server
5. Configure ADVANTAGE System and Network Server to communicate
6. Install Management application on user desktop computers

Please contact Medivators Technical Support for instructions or more information.

### Reviewing Cycle Logs from a Desktop Computer

ADVANTAGE reprocessing cycle logs are automatically stored on the ADVANTAGE Plus harddrive when set-up as a Stand-alone System. In this design, cycle data logs may be exported as a tab delimited file and transferred to a desktop computer via a jumpdrive for uploading into MS Excel.

The ADVANTAGE Management software that is located on every ADVANTAGE unit, may also be installed on a desktop computer for cycle log data analysis. This software program reads the ADVANTAGE database and stored cycle logs. During installation of the Management software, the installer must enter the ADVANTAGE database location.



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### Database Backups of ADVANTAGE Stand-alone Systems

The ADVANTAGE Plus 2.0 uses Microsoft SQL Server 2008 Express to generate the database files.

The databases should be backed up on a regular basis. Although the mirrored hard drives do provide protection against a single hard drive failure, regular backups of the database to a remote location (CD, memory stick or remote server) will protect against database corruption or complete system failure. Follow the procedures established by your facility for scheduling and storing backups.

There are many utilities available to generate backups. Each facility should use the utility that works best for the specific requirements of their site. The ADVANTAGE Plus 2.0 system is preinstalled with the backup utility SQLBackupAndFTP, For more information on this utility see the web site [www.sqlbackupandftp.com](http://www.sqlbackupandftp.com).

### ADVANTAGE Reprocessing System Patching

When an ADVANTAGE system is installed in a facility, the IT departments see the system as a PC. If the system is connected to their internal network, IT wants to ensure the security level of the ADVANTAGE PC meets the same security standards as all other PCs in the facility.

Windows XP and its applications are classified as “extended support,” which means no major updates will be made to the system, only critical patches and emergency security patches. Minntech does not supply patches to installed ADVANTAGE systems. Minntech allows IT technicians the ability to apply emergency patches to the ADVANTAGE Windows XP system in order to keep it up-to-date. Minntech will provide system support if any problems are encountered or if emergency security patches are required for the system to be connected to a network. Minntech does receive notifications of security patches so ADVANTAGE units ship with the most up-to-date patches. Also, the ADVANTAGE is installed with the latest Service Packs so minimal patching will be required in the field. Please note that patches can be removed.

One of the security issues is the use of virus checking on the ADVANTAGE. Virus checking applications do take significant disk storage bandwidth and CPU cycles. Since the LIO application is a real time application, any virus checking must be done when the ADVANTAGE system is idle.

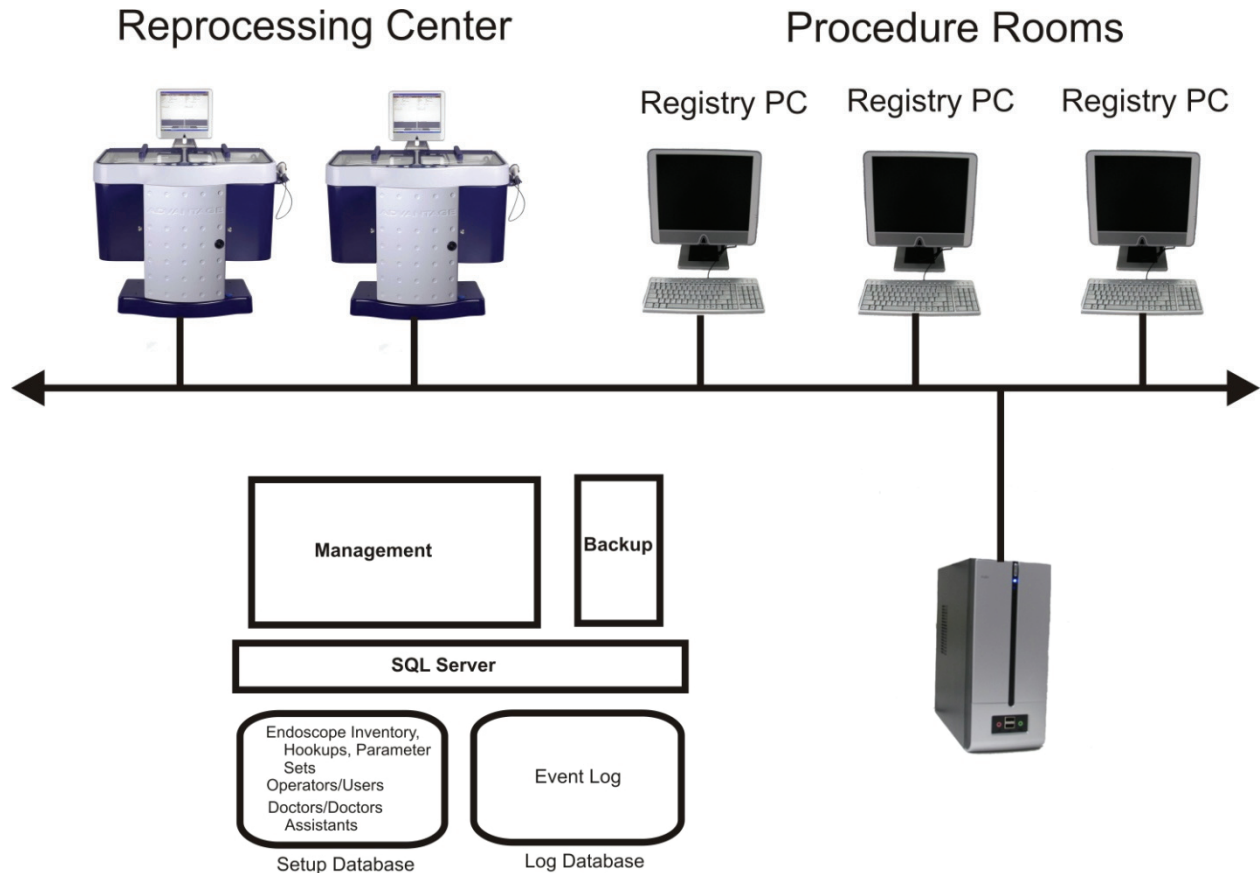




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### ADVANTAGE Endoscope Registry



### Endoscope Registration

Endoscope registration is a sub-program within the ADVANTAGE reprocessor that allows the selection of and assigning of a reprocessed endoscope to a specific procedure/patient. The endoscope selection, patient ID, doctor and assistant can be entered in the Registration program via a networked computer in the procedure room. Once an endoscope is selected, it is marked as “out of service” in the Registration program until it is reprocessed.

The endoscope is then physically used for a procedure. After the procedure, pre-cleaning, leak testing and manual cleaning, the endoscope is then scanned at the ADVANTAGE Plus reprocessor for high level disinfection. The ADVANTAGE Plus connects the records entered in the procedure room to the reprocessing cycle for this endoscope so the patient and physician ID do not need to be reentered.





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The Registration Program allows for tracking of endoscopes that are being used in a procedure or are reprocessed and available to be assigned to a procedure. This system is also helpful for facilities with multiple procedure rooms and a limited number of specialty endoscopes.

### ADVANTAGE Remote Diagnostics

The ADVANTAGE Plus unit is the first AER designed to provide remote diagnostics and repair capabilities via an internet connection. The ADVANTAGE Plus system can be operated and configured from a remote location. ADVANTAGE systems can be monitored for performance evaluation or failures & operators can be assisted with reprocessing cycles and editing user or scope information. Many customer issues or problems can be addressed using remote diagnostics resulting in faster problem resolution and less interruptions in scope reprocessing flow. With remote diagnostics, as many as 60% of the service calls can be addressed without dispatching and engineer.

There are three methods available to provide the remote diagnostic capability:

1. GoToMyPC.com
2. Logmein.com
3. VPN Client Access System

#### **GoToMyPC.com**

GoToMyPC.com provides remote desktop access to the ADVANTAGE system. It's an easy and secure remote-access solution that enables Medivators Technical Service or Biomed Departments to conveniently access each ADVANTAGE system at the customer installation site.

The architecture of GoToMyPC is provided by a Citrix GoToMyPC Server. Citrix has developed technology to provide high performance transmission of graphics and data over the internet. The Citrix server is accessed using a web browser (Internet Explorer) and accessing url [www.gotomypc.com](http://www.gotomypc.com).

Remote diagnostics through GoToMyPC.com has several security layers. No patient data or protected health information can be accessed and only the patient ID (in alpha numeric form) is stored in the ADVANTAGE system database. A user account is established on the GoToMyPC.com server for each ADVANTAGE system installed and a double password login is required to access these accounts. Once logged in to GoToMyPC.com from the remote location, the technician must also log into the ADVANTAGE system using a second assigned password. If a customer wants to restrict access, the GoToMyPC function can be shutdown or access can be restricted to off-hours. Biomed departments can also have access to perform remote diagnostics through GoToMyPC.com.



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#### **LogMeIn.com**

LogMeIn.com is another web-based graphics and data transmission program and is an alternative solution to GoToMyPC.com.

#### **VPN – Not available**

Some facilities do not allow the use of a web-based program such as GoToMyPC.com or LogMeIn.com and prefer the use of a VPN. A VPN, or Virtual Private Network, is a computer network that allows specified users secured access to a facility's network. It allows for data transfers between networked devices which are not on the same private network. Access is only given to specific areas/files of the network with the intention to safeguard against any potential security breaches.

Connections via a VPN are not available for the ADVANTAGE Plus.



Manufactured in the USA by:

**MINNTECH<sup>®</sup>**  
A Cantel Medical Company

Minntech Corporation   
14605 28th Avenue North  
Minneapolis MN 55447 USA  
Phone: 763.553.3300  
Toll Free: 800.328.3340  
Fax: 763.553.3387  
Web: [www.minntech.com](http://www.minntech.com)

Minntech BV  
Sourethweg 11  
6422PC Heerlen  
The Netherlands  
Phone: +31 45 5 471 471  
Fax: +31 45 5 429 695  
email: [info@minntechbv.com](mailto:info@minntechbv.com)



Minntech Asia / Pacific Pte Ltd  
1A International Business Park  
#05-01 Singapore 609933  
Phone: +65 6227 9698  
Fax: +65 6225 6848

Minntech Beijing Representative Office  
Room 708, 7th Floor Kaiheng Center,  
No. 2 Chaoyangmennei street  
Dongcheng District, Beijing China, 100010  
Phone: +8610 6567 8446  
Fax: +8610 6567 8445