DatamedRcv™ DRCV01

Service Manual

CAUTIONS
This product is not intended for home use.

REGULATORY
This product is not a medical device.

IMPORTANT LINKS
System Requirements
End-User License Agreement
Support & Maintenance Plan Description

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DISCLAIMER

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Datamed LLC	Datamed
GE Medical Systems Information Technologies, Inc	MAC, MUSE, and MAC VU360
General Electric Company	GE
Microsoft Corporation	Microsoft and Windows Server
SafeNet Data Security Ltd.	HASP
Silex Technology America, Inc.	Silex Technology
ZOLL Medical Corporation	ZOLL, E Series, and M Series
Zoom Telephonics	Hayes

INTENDED USE

This product is a software application intended to receive transmissions from any device that uses the GE® transmission protocol and write the data to a file. This product does not alter the transmitted data in any way. It is not intended to be used for any other purpose and attempting to use it for any other purpose is a violation of the EULA.

PROTECTED HEALTH INFORMATION (PHI) CONSIDERATIONS

The file that is received by this product may or may not contain PHI. As this product does not interact with the contents of the file except to receive and write it out, no data from the file is written to the log. If the file contains PHI then appropriate measures should be taken to ensure the security of the file. When planning the physical and electronic security of the installation, it is important to be aware of this data and plan accordingly. PHI may appear in the following locations:

- Debug Folder – If Debugging is enabled, the debug files are written here. The debug file will contain the raw data transmitted from the sender and therefore may contain PHI. This data is always encrypted.

SECURITY CONSIDERATIONS

Organizations should ensure that the Computer operating system is deployed, configured, and managed to meet the security requirements of the organization. As part of the planning process here are several recommendations and notes that should be factored in:

- It is recommended that this product be installed on a Computer with only software related to this one such as other Datamed® modules and related vendor-provided software.
- The organization is responsible for securing and maintaining the Computer that this product is installed on. DLLC does not restrict the antivirus products that can be used, nor are they validated. Likewise, OS patches are not restricted or validated.

TABLE OF CONTENTS

CHAPTER 1 – GETTING STARTED

T he DatamedRcv™ DRCV01 Receiver Module ("***DRCV01***") is a utility that receives LAN transmissions from compatible devices and writes the received data to a file. It is intended to be used with the DatamedFT™ EKG Format Translator. The program runs as a system service and will monitor a TCP/IP port and/or one or more serial ports for connections from GE® cardiographs and monitors that transmit using the CSI or DCP protocol, as well as certain ZOLL® defibrillators. As each EKG is received by DRCV01 it is written to the configured output folder where the DatamedFT™ Format Translator will pick it up and translate it to the appropriate destination format and location. DRCV01 can handle incoming requests from multiple supported cardiographs simultaneously.

The following list describes the native method of transmitting EKGs for some of the compatible devices:

- GE® MAC® 600 - This cardiograph can transmit through the serial port (with or without a modem), or it can write files to an SD card.

- GE® MAC® 800 - This cardiograph can transmit through the serial port (with or without a modem), through the built-in modem (if installed) or through the built-in LAN port (if the option is enabled). It can also write files to an SD card.

- GE® MAC® 1200 – This cardiograph can only transmit through the serial port (with or without a modem).

- GE® MAC® 1600, MAC® 3500, MAC® 5500, and MAC® 5500HD - These cardiographs can transmit through the serial port (with or without a modem or wireless bridge), through the built-in modem (if installed) or through the built-in LAN port (if the option is enabled). It can also write files to an SD card.

- GE® MAC® 2000 – This cardiograph can transmit using a wireless dongle, or through the serial port (with or without a modem) or the built-in LAN port (if the option is enabled). It can also transmit using the SCP protocol and write files to an SD card.

- GE® MAC® 5000 – This cardiograph can only transmit through the serial port (with or without a modem or wireless bridge). It can also write files to a floppy disk.

- GE® MAC VU360® , MAC 5, and MAC 7 – These cardiographs transmit using the DCP protocol over LAN or WLAN depending on the installed options.

- ZOLL® E-Series® (prior to rev 4.01) and M-Series® defibrillators – If equipped with the *12-Lead Option*, this device can transmit through the PC Card modem.

GE® offers a wireless transmission option for some of these models. This is a Silex wireless bridge that connects to the serial port on the cardiographs. DRCV01 is also compatible with the built-in LAN port for MAC® cardiographs that support it and have the option activated (800/1600/3500/5500).

All Datamed® Software is user-installed on a Computer provided by and maintained by the organization. DLLC does not require any direct access to the Computer. The organization is responsible for providing a technical resource with access to the Computer that will work with DLLC for the installation, configuration, updates, and any technical support. Under no circumstances will DLLC accept any unmonitored access such as VPN to the organization's network or to the Computer.

IMPORTANT NOTE: Support must be maintained for continued operation of the software. As specified in the EULA, the license will expire 2 years after support expires. If it is allowed to expire then a License Reactivation Fee must be paid along with the support renewal to re-enable the software.

Definitions, Acronyms and Abbreviations

DRCV01	DatamedRcv™ DRCV01
DFT	DatamedFT™ Format Translator
DLLC	Datamed LLC
SL	Software License Key
HL	Hardware License Key
ACC	Sentinel Admin Control Center (web page)
Computer	A physical or virtual machine running a supported version of a Windows® operating system where the DLLC software is installed
Configurator	DRCV01 Configurator (on the desktop)
Start Menu	Windows® Start Menu

Start Menu Shortcuts (for files in the install folder)

Install License Key Drivers	Shortcut to *HASPUserSetup.exe*
Sentinel License Utility	Shortcut to *DatamedSentinelUtility.exe*

CHAPTER 2 – INSTALLATION

Requirements

❖ **License Key.** The licenses that are required for the applications to run are contained in a License Key which can be either software or hardware.

   o A Software License Key is activated on a specific computer and locked to that computer. This is normally used for VMs.

   o A Hardware License Key is a specialized USB device (dongle) that must be accessible to the application at all times. This is normally used for a physical computer but it can be used with a VM by assigning it to the VM in the VM host configuration, or it can be plugged into a USB-to-Ethernet adapter and connected with a special driver. It should be green or black and look like one of these:

When the key needs to be updated (for license additions and support renewals), it is updated via email – see *Updating the License Key* later in this chapter for instructions. **NOTE: The HASP driver must be v9.12 or higher.**

❖ **Software**. The installation package from DLLC which will be supplied via download link.

❖ **Computer.** This software should be installed on the same computer as DFT. The minimum specifications for the computer at the time of this printing are: 4GB RAM, 40GB HD, and a LAN connection. The following operating systems are supported: Windows® Server 2016, Windows® Server 2019, Windows® Server 2022, and Windows® Server 2025. The .NET 4.8 Framework (or higher) must be installed on this computer. Check the DLLC website for the latest changes to the system requirements.

❖ **TCP/IP connection.** LAN connectivity can be achieved by utilizing a serial to LAN adapter (e.g. Silex wireless bridge) on the serial port. Depending on the adapter, either wired or wireless LAN is possible. Instructions for setting up these adapters can be found in *Chapter 5*. Please review the list of network information required. For the MAC® cardiographs with built-in LAN port, if the LAN option is enabled on the carts then a direct connection is possible.

❖ **Serial Connection.** All compatible cardiographs and devices support a serial connection. When using a serial connection either a direct serial cable or modems can be used. If using modems, both the cardiograph/device and the computer running DRCV01 will require a modem. GE® typically uses the MultiTech MultiModem ZBA (MT5634ZBA) modems. It is highly recommended that a modem from the same product family (MT5634ZBA, MT5634ZBA-USB, MT9234ZBA, MT9234ZBA-USB) be used for DRCV01. *Due to the incompatibilities encountered in testing, only the MultiTech modems are supported for use with DRCV01*. IMPORTANT NOTE: If a RS232 modem is used (as opposed to USB), the serial cable must have all control lines connected.

New Software Installation

These instructions are for a new installation where there is no prior version of DRCV01 installed. This can also be used if DRCV01 was uninstalled. The Configurator will need to be run after installation to configure the settings.

NOTE: DRCV01 v1.x cannot be directly upgraded to v3.x. To upgrade from v1 to v3 follow the Updating instructions later in this chapter.

Step 1: Install the DRCV01 software

➢ The installer will be delivered as a download link. After downloading, double click on *DatamedRcv_DRCV01_Setup_v3.x.x.exe*. The following screen should appear. Select the appropriate language and then click *Next* to continue.
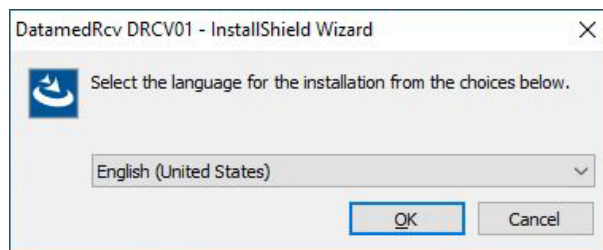
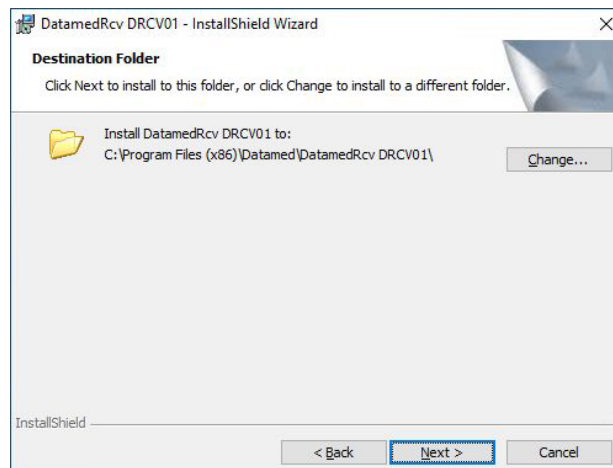➢ The introduction screen will appear. Click *Next* to continue.
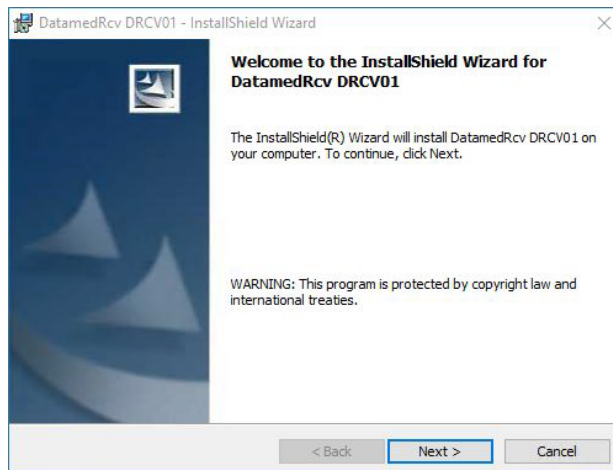
➢ Read the License Agreement carefully. *IMPORTANT: THIS EULA IS A BINDING CONTRACT BETWEEN THE ORGANIZATION (END USER) AND DATAMED LLC FOR THE USE OF THE SOFTWARE. THE TECHNICIAN INSTALLING THE SOFTWARE MUST HAVE THE AUTHORITY TO ACCEPT A CLICK-THROUGH CONTRACT ON BEHALF OF THE ORGANIZATION*. Once you confirm this authority and review the license, select *I accept the terms in the license agreement* and then click *Next* to continue.

➢ Select the installation folder for the program (normally the default location) and then click *Next* to continue.

➤ When ready, click *Next* to begin the installation. Installation should take no more than 1-2 minutes.
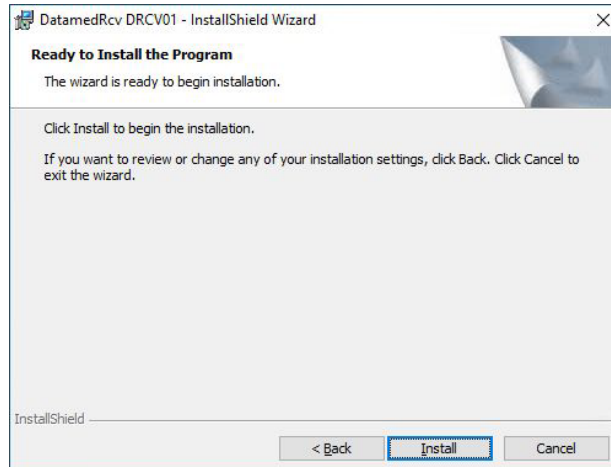
➤ Once installation is complete, this screen will appear. If you want to run the configuration utility (Configurator) immediately, check the *Launch DatamedRcv DRCV01* box. Note that you can't start the software until the license is activated. Click *Finish* to close the window.
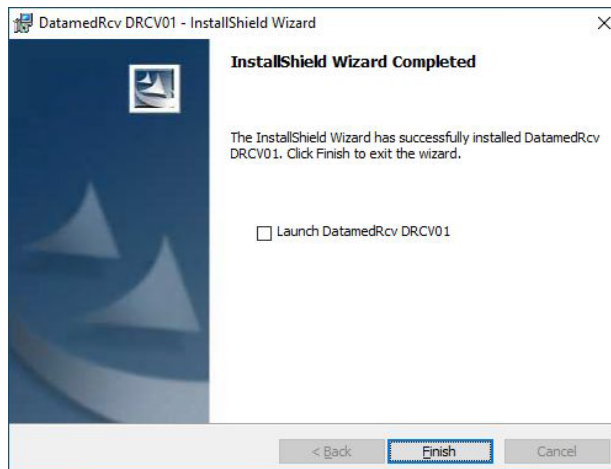
Step 2: Install the License Key Driver

➢ The license key driver and the Software License Key (if applicable) will only be installed and activated once on the Computer, regardless of how many Datamed suite applications are installed. If the license has already been activated with a previous module such as DFT then skip to the next step.

➢ To install the license key driver, open the Start Menu and locate *DatamedRcv DRCV01 → Install License Key Drivers*. Run this to install the full driver package. The driver includes a web-based interface called the Sentinel Admin Control Center (ACC) with tabs on the left side that allows a user to view the license key(s) and the license entitlements (products and features), apply license updates, and gather diagnostics. It will show license keys that are installed on the local Computer and also any other servers in the same subnet. To access the ACC (a) select *Sentinel Admin Control Center* from the Start Menu, (b) open a browser to http://localhost:1947, or (c) choose *Open Sentinel Admin Control Center* from the *Tools* menu in the Configurator.

➢ Here are some useful direct URLs for the ACC screens:

    a. *Sentinel Keys*: http://localhost:1947/_int_/devices.html

    b. *Update/Attach*: http://localhost:1947/_int_/checkin.html

    c. *Diagnostics*: http://localhost:1947/_int_/diag.html

Step 3 Option 1: Activate a Software License Key

➢ This is a two-step procedure that requires coordination with DLLC and only takes a few minutes. The first step is to collect the license fingerprint and send it to DLLC, and the second step is to apply the activation file that we send back. It can be done using the web interface (ACC) or using a standalone utility. To use the ACC:

a. Open the ACC and go to *Sentinel Keys*. If the driver and DLLC library were installed properly then there will be a line with Location "Local", Vendor "11974", Key Type "Reserved for New SL Key", and Configuration "SL". Click the **Fingerprint** button to the right to generate a fingerprint file (.c2v). This will be written to the default download folder. Send that to support@datamed.com for activation.


b. When you receive the activation file (.v2c), open the ACC again and select Update/Attach on the left-side menu. Use Select File to browse to the activation file and then click Apply File. Notify DLLC support if there is an error message instead of a success message.
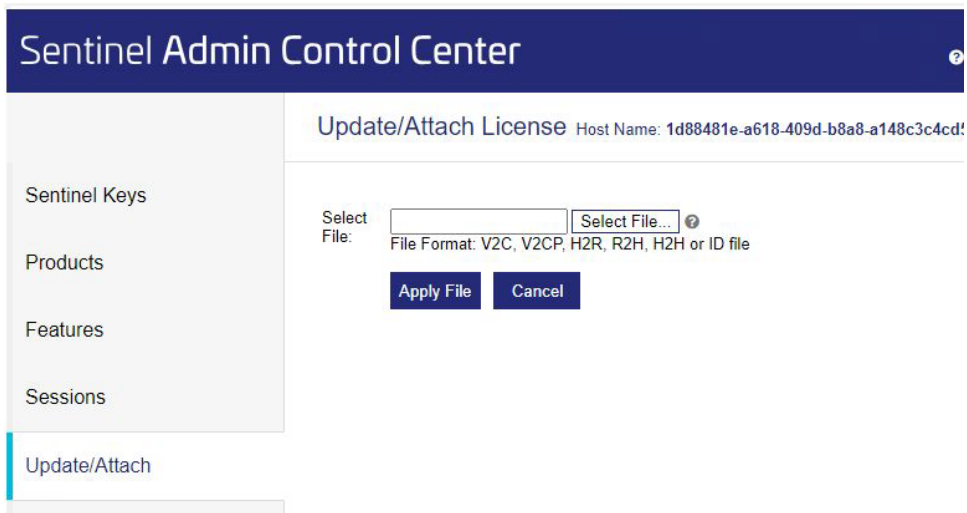
➢ To use the standalone *Sentinel License Utility*:

  a. Open *Sentinel License Utility* from the Start Menu or from the Tools menu in the Configurator. On the *Collect Status Information* tab select *Installation of new protection key* and then press **Collect Information** to generate a fingerprint file (.c2v). Send that to support@datamed.com for activation.
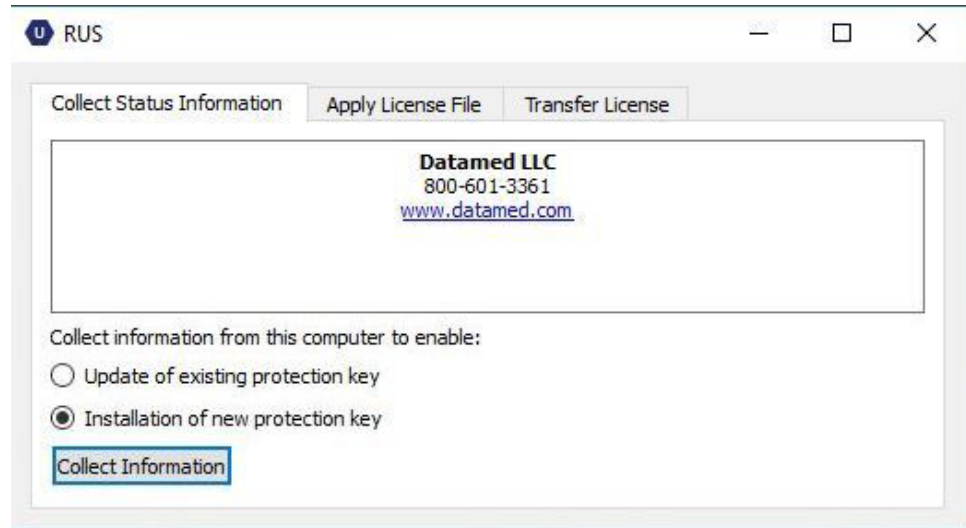
  b. When you receive the activation file (.v2c), open the *Sentinel License Utility* again. On the *Apply License File* tab press the button with 3 dots at the bottom to browse to the activation file and select it, then click *Apply Update*. Notify DLLC support if there is an error message instead of a success message.
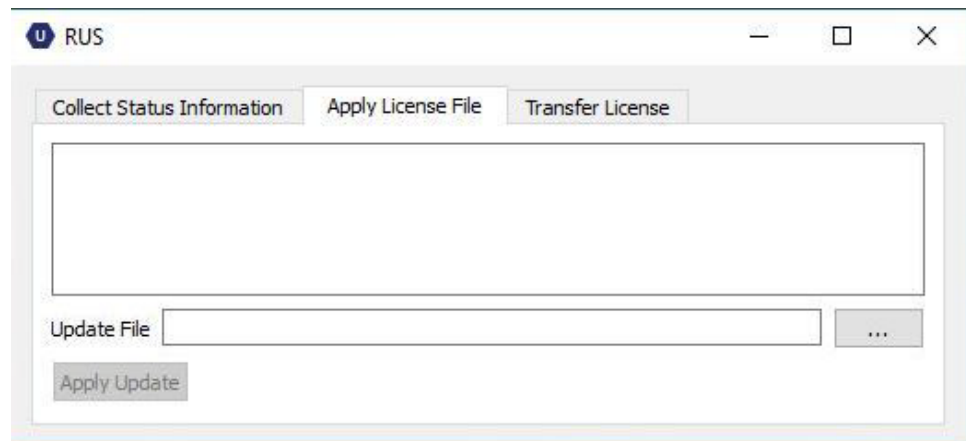
➢ Check to confirm that the license is activated and accessible. Open the ACC and go to *Sentinel Keys*. If the driver and DLLC library were installed properly then there will be a line with Location "Local", Vendor "11974", and Key Type "HOST SL AdminMode". The Key ID is specific to this Computer and should be checked for a match with the filename when applying an update. A Serial Number has also been assigned but is not visible in the ACC, only in the Configurator.

Step 3 Option 2: Install a Hardware License Key

➢ For a Hardware License Key, insert the hardware key into the USB port and confirm that the LED inside the key lights. If you are using a USB-to-Ethernet adapter follow the instructions that came with the adapter and install the driver, then configure it to point to the adapter and USB port.

➢ Check to make sure that the License Key is available. Open the ACC and confirm that you see the License Key in the list with Location "Local" and Vendor "11974".

Step 4: Configure the software

➢ Start the Configurator and enter the desired settings. See *Chapter 3* for details.

Updating the Software

If DRCV01 v3.2 or higher is already installed, running the setup program will update it. The screens are the same as a new installation.

If DRCV01 v3.0 or v3.1 is already installed, the old shortcuts in the Datamed folder on the Start Menu must be manually removed before installing v3.2. It is normally here: C:\ProgramData\Microsoft\Windows\Start Menu\Programs. Locate **"Datamed"** in this folder and delete it. Then run the setup program normally to update in place.

If DRCV01 v1.x is installed, follow these steps:
- Stop the *DatamedRcv_DRCV01* and *DatamedRcv_DRCV01Start* services.
- Open the Configurator and copy all the settings down manually.
- Uninstall the old version. Reboot the server if prompted to do so.
- Follow the instructions above for a new installation, including installing the latest license key driver. A license update will be supplied if there is already a Software License Key installed.
- Start the Configurator and configure it with the settings you wrote down.

Uninstalling the Software

To uninstall DRCV01, do one of the following: 1) from the Start Menu locate *DatamedRcv DRCV01 → Uninstall DRCV01* and select it; or 2) open *Control Panel*, choose *Add or Remove Programs*, select *DatamedRcv_DRCV01*, and press the *Remove* button. In either case the application will be removed. It may take a minute or two for the uninstall to complete. Note that only the application is removed – all ECG files and logs will remain as well as the License Key Driver.

Updating the License Key

When support is renewed or licenses are added, the License Key must be updated. DLLC will email a license update file (.v2c) which needs to be applied. This can be done using the web interface (ACC) or using the standalone Sentinel License Utility.

Applying an update using the ACC

➢ Open the ACC and select Update/Attach on the left-side menu (the direct URL is http://localhost:1947/_int_/checkin.html). Use Select File to browse to the activation file and then click Apply File. Notify DLLC support if there is an error message instead of a success message.
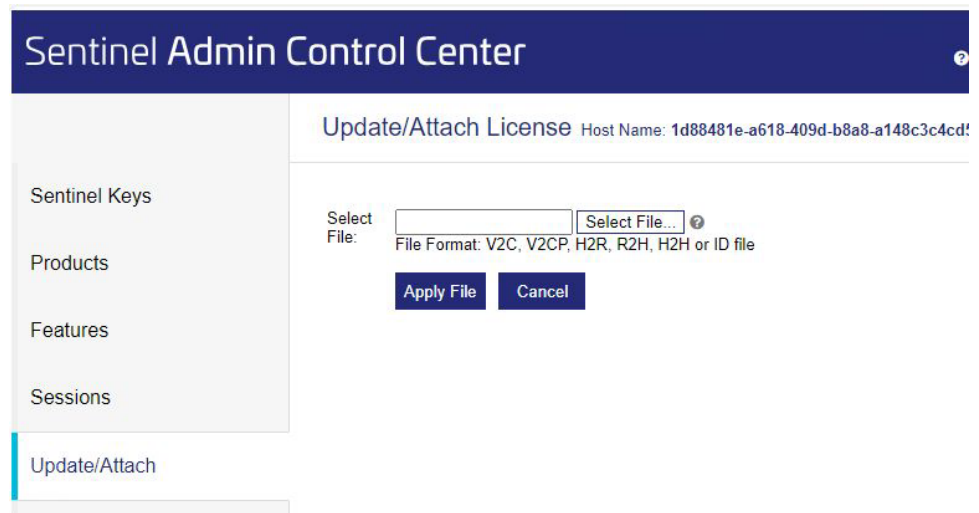
Applying an update using the Sentinel License Utility

➢ Open the *Sentinel License Utility* from the Start Menu or from the Tools menu in the Configurator. On the *Apply License File* tab press the button with 3 dots at the bottom to browse to the activation file and select it, then click ***Apply Update***. There should be a success message, otherwise let us know if there is an error.
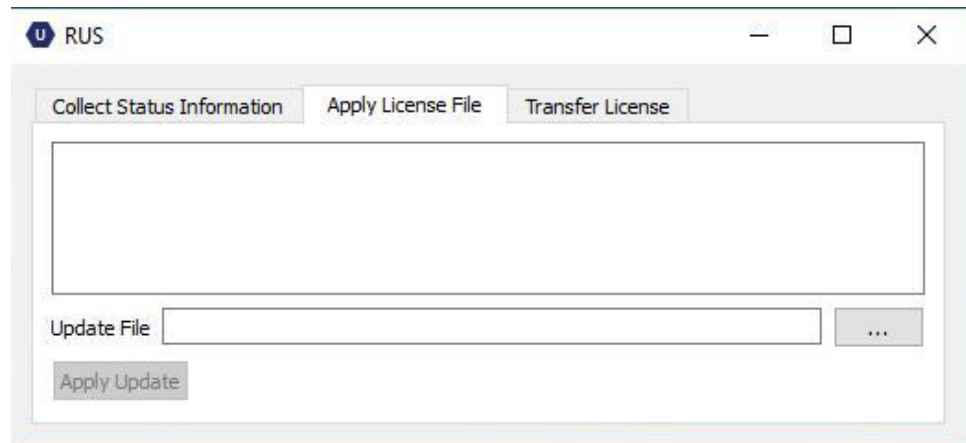
➢ Check to confirm that the license is activated and accessible. Open the ACC and go to *Sentinel Keys*. If the driver and DLLC library were installed properly then there will be a line with Location "Local", Vendor "11974", and Key Type "HOST SL AdminMode". The Key ID is specific to this Computer and should be checked for a match with the filename when applying an update.

In some cases DLLC will need to collect a new fingerprint file from the Computer for a Software License Key. This can happen when there is a change to the computer that affects the "internal fingerprint" used by the license software. Collecting this fingerprint file (.c2v) can be done using the web interface (ACC) or using the standalone DatamedSentinelUtility. Once the file is collected it should be sent to DLLC.

➢ Open the ACC and select Sentinel Keys on the left-side menu. On the line with Location "Local", Vendor "11974", and Key Type "HOST SL AdminMode", press the C2V button on the right side to generate the file.

➢ Open the *Sentinel License Utility*. On the *Collect Status Information* tab select *Update of existing protection key* and then press ***Collect Information*** to generate the file.

Post-Installation Notes

If this was an update the configuration settings will already be set up and should not need to be changed. For a new installation the configuration settings will need to be set up. Configuration settings are changed by using the Configurator utility. A shortcut to this utility will be found on the desktop, and it can also be found on the Start Menu under *DatamedRcv DRCV01 → DRCV01 Configurator*. See *Chapter 3* for a complete description of the configuration settings.

We recommend setting the service *Startup Type* to **Automatic (Delayed Start)**. After installation open the *Services* applet, locate the *DatamedRcv_DRCV01* service, right-click on *Properties*, and change *Startup Type* to **Automatic (Delayed Start)**. An alternate method is to run this from the command line (note that the space after the '=' is required):

    sc config DatamedRcv_DRCV01 start= delayed-auto

Note that the *DatamedRcv_DRCV01* service will not start automatically until the computer is rebooted. It can also be started interactively using the Configurator utility. An alternative method of starting the service is to open the **Services** applet from *Control Panel → Administrative Tools* and start *DatamedRcv_DRCV01*.

IMPORTANT NOTE: Normally this application is installed on the same computer as DFT and the output goes to a local folder which is DFT's Input Folder. If the output will be directed to a shared folder on a separate computer, the account that the *DatamedRcv_DRCV01* service runs under is critical to the proper operation. By default, the service will run under the Local System account and this account does not have access to the network, so it will not work correctly. In this situation, after installation and configuration it is very important to set the service to run with a domain (or workgroup) account. It will also be necessary to add the same domain (or workgroup) account to the folder that is being shared on the destination server.

Once the setup is complete and any accounts/permissions/shares have been addressed, the receiving process should be tested. The best way to do this is with DFT temporarily stopped. A cart should be configured and a test transmission done. As long as a file appears in the Output Folder (DFT's Input Folder) then this installation is complete.

Once DRCV01 is installed, changes to the configuration settings can be done using the DRCV01Config utility that is installed along with the service. Open the utility from the desktop shortcut or from the Windows™ Start menu and it will automatically read the current configuration settings from the registry. When configuration changes are made, they must be saved and then the service must be restarted for them to take effect.
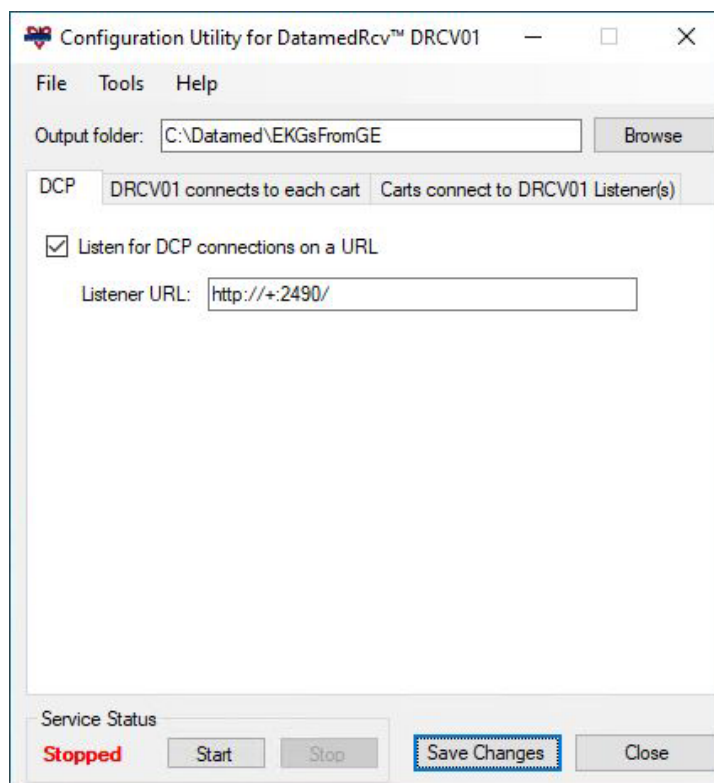
Window Settings

At the top of the window there is one item:

- *Output folder*. The folder that incoming EKG files are written to. This must be the *Input folder* for DFT. If DFT is installed on the same computer (typical) then it will be a local folder. If DFT is installed on a different computer then this will be the network path to a share on the remote computer (\\computername\sharename). The computername can be specified as a name or IP address. The *Browse* button allows you to browse for the folder to use (or create one). **IMPORTANT NOTE: If the *Output***

folder is on a network share, the Log On account that the *DatamedRcv_DRCV01* service is running under *must* have permissions to access that share. The default account for services is the System Account, which *does not* have network access permissions. The account can be changed by opening the Services applet from the *Help* menu and changing the properties for the DatamedRcv_DRCV01 service.

At the bottom of the window there is a status indicator and four buttons:

- *Service Status*. This shows the current status of the *DatamedRcv_DRCV01* service. There are several possible values: *Stopped* – indicates that the service is not running; *Running* – indicates that the service is running; *Starting* – which indicates that the service is in the process of starting; *Stopping* – which indicates that the service is shutting down; *Paused* – which indicates that the service was manually paused; and *Unknown* – which indicates a problem. The blue statuses are normally transitional so if the status remains for more than a couple of seconds then there is a problem. The most common reason for this condition is that the License Key is not present or accessible.

- *Start*. This button will start the *DatamedRcv_DRCV01* service.

- *Stop*. This button will stop the *DatamedRcv_DRCV01* service.

- *Save Changes*. This button will cause all configuration changes to be saved to the registry. Previous settings will be discarded.

- *Close*. This button closes the window. Any unsaved changes will be discarded.

Menu Options

The following menu options are available:

- *File → Reload from registry*. Selecting this will cause any changes to be discarded and the settings on the screen reset to the saved values.

- *File → Save to registry*. This is the same as clicking the *Save Changes* button.

- *File → Import settings from file*. This will load configuration settings from a DRCV01 Settings (.dr1) file. This file is created by exporting the settings. Note that the settings are loaded into the window, but are not saved to the registry until the *Save Changes* button is clicked.

- *File → Export settings to file*. This will save the configuration settings *as they exist in the window* (possibly edited) to a DRCV01 Settings (.dr1) file. This file should not be edited manually. Typically this functionality is used to send the configuration settings to DLLC for troubleshooting.

- *File → Enable debugging*. In the event that there is a problem with the translator, DLLC support personnel may want to collect detailed technical information. After

checking this option and restarting the service, files containing debugging information will be written to the *Output Folder*. This information should be sent to DLLC support for analysis. See *Chapter 6* for more details.

- *File → Exit*. This is the same as clicking the *Close* button.

- *Tools → Open Windows Event Viewer*. This will open the Event Viewer to the Application Event Log.

- *Tools → Open Windows Services Manager*. This will open the services applet so that you can access the properties for Windows services.

- *Tools → Open Sentinel Admin Control Center*. This will open the ACC web page using the default browser.

- *Tools → Open Sentinel License Utility*. This will run the *DatamedSentinelUtility.exe* utility in the installation folder.

- *Help → About*. This will open a window that displays information about the application and the license details.

- *Help → Open Datamed Website*. This will open datamed.com using the default browser.

Tab: DCP

This tab contains the settings for DCP connections. Each setting is described below. The settings shown in the screenshot are the defaults.
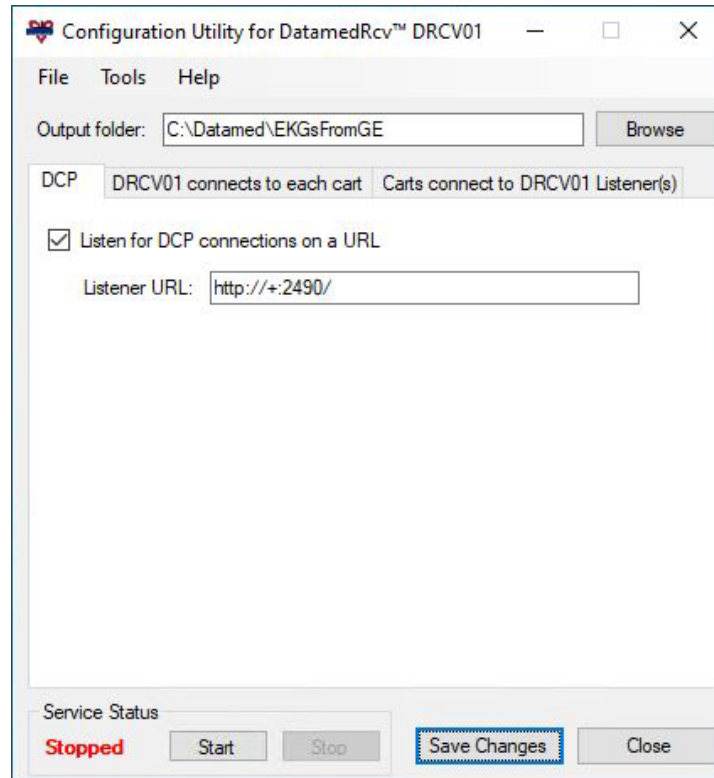
- **Listen for DCP connections on a URL**. If this box is checked, the specified URL will be monitored for incoming connections from carts.

- **Listener URL**. This specifies the URL to listen on for incoming connections. The plus (+) represent the server's IP address, and the number after the colon is the port number. Early firmware versions were limited to http but newer versions may allow https. If planning to use https then check with GE to confirm cart firmware support. Note that port 2490 is the default for these carts.

Tab: DRCV01 connects to each cart

This tab contains the settings for connections that are initiated and maintained by DRCV01. It can be used with carts using a Silex™ wireless bridge as well as carts that have a built-in LAN port. *This method of connecting to the carts is the one used by MUSE® and should always be the preferred method*. Each setting is described below. Note that the settings shown in the screenshots are just sample data.
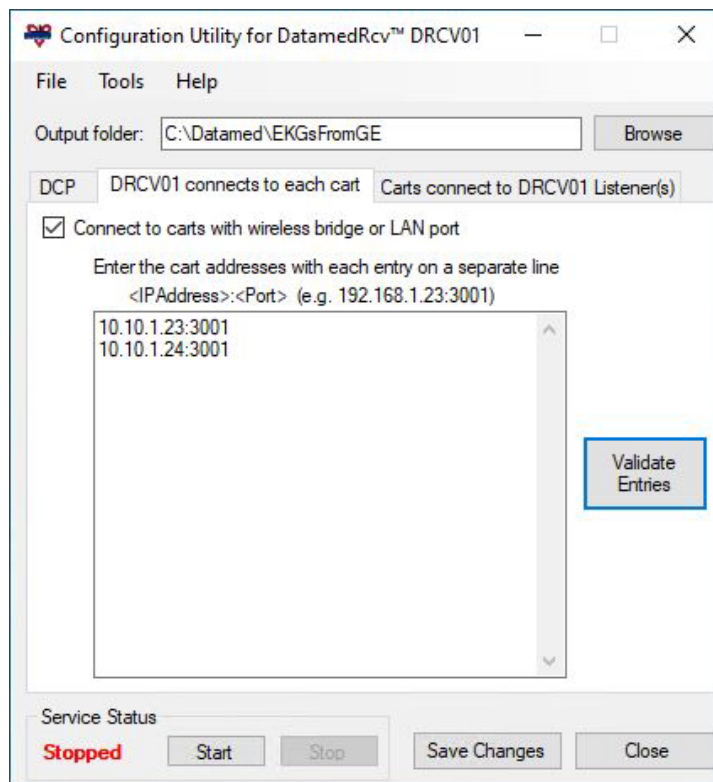
+ *Connect to carts with wireless bridge or LAN port*. If this box is checked, connections will be established with all of the carts listed in the address box.

+ *Enter the cart addresses….* This text box must contain the IP address and port of each cart that will be connected. In contrast to the TCP/IP Settings where the address of this computer was used, the setting here is the address configured in the cardiograph itself. The format of each line is the IP address then a colon, and then the port number.

+ *Validate Entries*. After entering the cart addresses in the text box, press this button to validate the formatting of the addresses. Any invalid entries will be removed.

Tab: Carts connect to DRCV01 Listener(s)

This tab contains the settings for TCP/IP connections that use a serial-to-LAN adapter and also for serial connections (direct or modem). Each setting is described below. Note that the settings shown in the screenshots are just sample data.
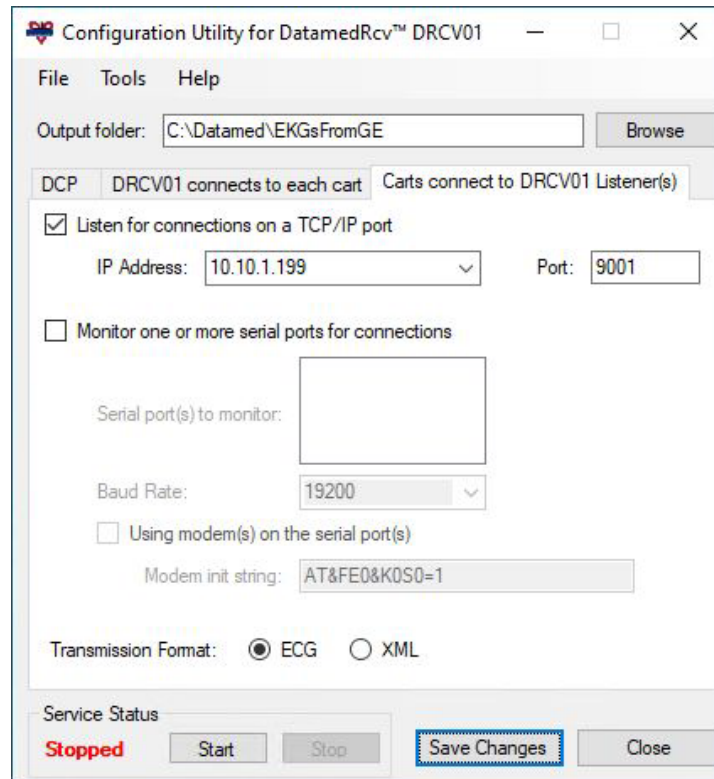
TCP/IP Settings:

- *Listen for connections on a TCP/IP port*. If this box is checked, a single TCP/IP port will be monitored for incoming connections from carts. This will only work with serial-to-LAN adapters (wireless bridge), not the built-in LAN port. When configuring the serial-to-LAN adapter, the IP address and port configured here must be used.

- *IP Address*. This specifies the IP address of the PC that is running DRCV01. The drop-down list should contain all possible addresses. Normally there is only a single address in the list, but some computers may have more than one. Select the appropriate address from the list.

- *Port*. This is the port number that will be monitored for incoming connections. This port must not be monitored by any other process, and any firewall must be configured to pass data to this port.

Serial Settings:

- *Monitor one or more serial ports for connections*. If this box is checked, one or more serial ports will be monitored for incoming connections from carts.

- *Serial port(s) to monitor*. This list will show all serial ports that are configured on the computer. Check any ports that are used to connect to the carts. Any number of ports may be monitored, but keep in mind that all ports must have the same type of connection (i.e. modem or direct cable). In other words, you can have several modems or several direct cables, but not a mix of the two.

- *Baud Rate*. This allows the baud rate of the serial port(s) to be set. Some carts can only support limited baud rates so this setting must be matched to the cart setting for direct serial connections. For modem connections this can normally be set to 57600 or 115200. Note that if multiple ports are configured they will all be set to the same baud rate.

- *Using modem(s) on the serial port(s)*. If this box is checked, all selected ports must be connected to modems.

- *Modem init string*. This string identifies commands that are sent to the modem to set it up for reception. The default string is correct for MultiTech® modems and should not normally be changed.

- *Transmission Format*. This setting specifies the formatting of the data that is being transmitted. *It only applies to incoming TCP/IP connections or serial connections that use a modem*. When setting up the Transmission Settings on the cardiograph, two choices are *Serial Line (MUSE)*, which corresponds to the *ECG* format, and *Serial Line (XML)*, which corresponds to the *XML* format. *ECG* format should always be selected because it is the native format of the device and because it has error checking built in to the transmission. Note that for extremely high rate EKGs (250bps+), artifacts may appear in the waveforms due to the characteristics of the file format. This specific issue is also observed in native GE® implementations (MUSE®).

CHAPTER 4 – CONFIGURING TRANSMITTING DEVICES

T he device that transmits EKGs to DRCV01 must be configured properly to be able to transmit EKGs successfully. This section is intended to provide some practical guidance for configuring these devices to send to DRCV01; however, this information is not from GE and you should always consult the device's user manual or a GE technician for definitive instructions. Also note that updates to the device firmware or software may render these instructions inaccurate.

GE® MAC® VU360, MAC® 5, MAC® 7, and MAC® 2000 cardiographs

MAC® VU360, 5, and 7 carts only support DCP transmission, while MAC® 2000 carts can use either DCP or CSI (the previous protocol). Future models are expected to only support DCP. The instructions below are presented as a general configuration guide and intended to help with the setup and operation of the device. However, this information is only general help and firmware changes or device option settings may introduce differences. Always refer to the device's user manual or your GE® representative for the approved instructions.

For the VU360 we recommend that the cart have firmware v1.02 SP01 or higher. The following steps are for the VU360 and may be different for other models:

1. Open the *Settings* screen from the top right-hand corner menu. When entering the setup screens you will probably need to enter the system password. If you don't have this please contact GE for assistance.

2. In the *Network* submenu configure the IP address and other settings as needed.

3. In the *Communication* submenu choose DCP, then enter the URL that is configured as the Listener URL on the DCP tab in the Configurator. For example: http://192.168.121.86:2490. The *Test Connection* button can be used to confirm connectivity as long as DRCV01 is running. Enable this as the Default and apply the settings.

4. In the *System/Device* section add the Device #, Location ID, Site #, and Institution Name.

5. Save the changes and exit to the main screen.

To record an ECG without an order touch *Start New Patient* on the top menu, then fill in the demographic date and save it. Click the green *ECG* button to record the ECG, then click *Transmit* to send the ECG to DRCV01.

GE® MAC®-5000 and MAC®-5500 Cardiographs

These cardiographs can be configured to transmit using a modem, a direct serial connection, a LAN/WLAN network (using a serial-to-LAN adapter), or using the built-in LAN connection (MAC®-5500 only). To set up the cardiograph for transmission, use one of the following checklists:

When using a serial-to-LAN adapter or direct serial connection

1. Press *More [F6]*, then *Main Menu*, then *More [F6]*, then *System Setup*
2. Enter the system password and press ↵ (Enter)
3. Select *Basic System* and press ↵
4. If you are using a serial-to-LAN adapter and connecting it with the special cable that supplies power (as opposed to using an A/C adapter), you will need to turn on power to the external adapter. This will increase the power consumption slightly, but it is needed for proper operation. Perform the following steps:
   a. Select *Miscellaneous Setup* and press ↵
   b. Select *Serial Power Always On* and press ↵, then select *Yes* and press ↵
   c. Select *Return* and press ↵
5. Select *Transmission* and press ↵
6. Select *Dial tone required* and press ↵, then select *No* and press ↵
7. Select *Use IR for Serial Line* and press ↵, then select *No* and press ↵   *[NOTE: this setting may not be present depending on the cart firmware]*
8. Select *Serial Line Baud Rate* and press ↵, then select *115.2k* and press ↵. If the maximum setting is less than 115.2k (e.g. 9600 or 19200), set it to the maximum.
9. Select *Default Location* and press ↵, then select *Serial Line (MUSE)* and press ↵
10. Select *Return* and press ↵
11. Again select *Return* and press ↵
12. Select *Save Setup* and press ↵
13. Select *Main Menu* and press ↵ to get back to the main menu
14. Press *File Manager [F5]* to access a list of EKG files to transmit
15. After selected the desired files, press *Transmit [F4]* to send the selected files

When using a modem

1. Press *More [F6]*, then *Main Menu*, then *More [F6]*, then *System Setup*
2. Enter the system password and press ↵ (Enter)
3. Select *Basic System* and press ↵
4. Select *Transmission* and press ↵
5. Select *Modem Speaker* and press ↵, then select *Dialing Only* and press ↵

6. Select *Dial tone required* and press ↵, then select *Yes* and press ↵

7. Select *Dialing method* and press ↵, then select *Tone* and press ↵

8. Select *Fax error correction* and press ↵, then select *No* and press ↵

9. Select *#1 Phone Number* and press ↵, then type in the phone number to reach the modem on the computer where DRCV01 is installed and then press ↵

10. Select *Location 1* and press ↵, for *Type* select *MUSE Network* and press ↵

11. Select *Use IR for Serial Line* and press ↵, then select *No* and press ↵   *[NOTE: this setting may not be present depending on the cart firmware]*

12. Select *Serial Line Baud Rate* and press ↵, then select *115.2k* and press ↵. If the maximum setting is less than 115.2k then use the maximum setting available. Either settings will work fine with a modem.

13. Select *Default Location* and press ↵, then select *#1* and press ↵

14. Select *Return* and press ↵

15. Again select *Return* and press ↵

16. Select *Save Setup* and press ↵

17. Select *Main Menu* and press ↵ to get back to the main menu

18. Press *File Manager [F5]* to access a list of EKG files to transmit

19. After selected the desired files, press *Transmit [F4]* to send the selected files

When using the built-in LAN port of a MAC®-5500

1. Press *More [F6]*, then *Main Menu*, then *More [F6]*, then *System Setup*

2. Enter the system password and press ↵ (Enter)

3. Select *Basic System* and press ↵

4. Select *Transmission* and press ↵

5. Select *Default Location* and press ↵, then select *Ethernet (MUSE)* and press ↵

6. Select *Return* and press ↵

7. Select *Network Setup* and press ↵

8. ***Enter the IP Address, Subnet Mask, and Gateway address that apply to the cardiograph (not the computer running DRCV01).*** This information can typically be obtained from the IT System Administrator. Then enter the Port Number that will be used by DRCV01 to connect to this machine. If there is a firewall between the cart and the computer then this port will need to be opened. This IP Address and Port Number will be used when configuring the Direct Connections tab in DRCV01.

9. Select *Return* and press ↵

10. Again select *Return* and press ↵

11. Select *Save Setup* and press ↵

12. Select *Main Menu* and press ↵ to get back to the main menu

13. Press *File Manager [F5]* to access a list of EKG files to transmit

14. After selected the desired files, press *Transmit [F4]* to send the selected files

CHAPTER 5 – CONFIGURING A WIRELESS BRIDGE

T he Silex Technology® wireless bridge can be purchased through GE as a cart option. Before beginning the installation, it is critical that the network information is gathered. DLLC recommends that a static IP address be used for the adapter. You will need to configure the IP address of the adapter (static address with gateway and subnet mask, or DHCP) and depending on the connection type selected you may need to add the IP address of the computer that is running DRCV01 on the adapter. In addition, for wireless connections the wireless network connection settings MUST be available. These settings include the SSID, security type (WEP, WPA, etc.), and passwords.

IMPORTANT NOTE: The instructions provided by GE® or Silex Technology® should always be used as the primary reference for configuring the wireless bridge. These instructions are provided as a backup and to highlight the important settings but they may not match the latest firmware.

Whether using wireless or wired LAN, the Silex adapter must typically be configured using the wired port. Connect a network crossover cable (available at most computer stores) from the adapter to a laptop or other computer. This will create an isolated network environment. To get power, either use the A/C adapter that came with the Silex, or connect the adapter to the cardiograph using the special serial power cable (see *Chapter 3* for configuration). The default configuration on the wired LAN port is for DHCP, however since there is no DHCP server on the isolated network, it will default to IP address 192.0.0.192. Set the computer's IP address to 192.0.0.191 (subnet mask 255.255.255.0, gateway 192.0.0.1) so that it will be able to connect to the Silex adapter.

Once the Silex adapter is connected to the LAN or directly to a computer, use a web browser to go to the adapter's IP address (192.0.0.192) to access the web interface. At the login screen the default password is "*access*". Click *Submit* to login.
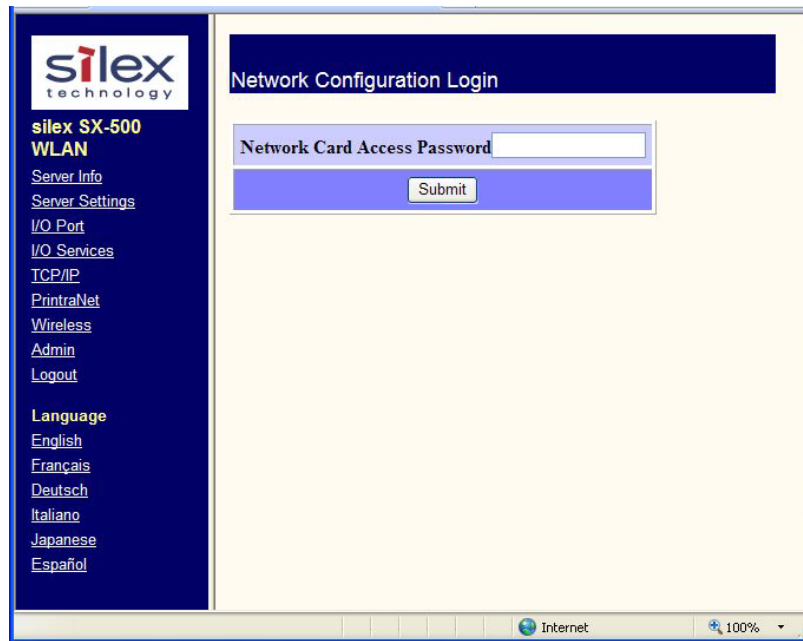
IMPORTANT NOTE: When making changes, press the **Submit** button at the bottom of each page, but don't press **Reset** until all changes have been saved. Note that due to a quirk in the web interface, the saved settings may not show up on the screen until the adapter has been reset, even though they have actually been saved. Once all desired changes have been saved, press the reset switch. To restore the factory settings, press and hold the reset switch on the adapter for 5 seconds.

Clicking on *I/O Port* in the left sidebar menu will bring up the I/O Port Setting screen. The important changes are described below. Some firmware versions add a setting called *Local Port* below *Destination Port* and it should be set to the same value as *Destination Port*. If DRCV01 will be configured to connect to the carts then disable *ECable Mode*. If DRCV01 will be configured to listen for connections from the carts then enable *ECable Mode* and enter the IP address and port that DRCV01 is configured to listen on. Click *Submit* to save the settings.

I/O Port Settings

Port Name	S1
Port Type	Serial
Baud Rate	115200
Bits per character	8
Stop Bits	1
Parity	None
Flow Control	None
ECable Mode	⦿ Enable ◯ Disable
Destination IP Address	192.168.1.13
Destination Port	9100
Connection attempt time	30 sec
Console Mode String	
Port Filter	TRAP

Submit

Baud Rate should be set to 115,200.

If using "DRCV01 connects to each cart" tab then disable ECable Mode.

If using "Carts connect to DRCV01 Listener" tab then Enable ECable Mode and enter the Destination IP and Port that match the DRCV01 settings.

Clicking on *TCP/IP* in the left sidebar menu will bring up the Configure TCP/IP screen. If DRCV01 will be configured to connect to the carts then click on the second link in *Enabled Services* and enter the port that this adapter will listen on – this is the port that must be entered with the adapter's IP address in DRCV01. In the *IP Address* section enter the IP address of the Silex adapter - not the computer. Although DHCP can be used, a static IP address is strongly recommended. Make note of the IP address by placing a label or sticker on the case of the adapter. Click *Submit* to save the settings.

If using "DRCV01 connects to each cart" tab then click here and enter the port number to listen on

Enter the IP Address and other settings.

If the wireless capability will be used, click on *Wireless* in the left sidebar menu to bring up the Configure Wireless screen. The important changes are described below. Click *Submit* to save the settings.

To configure the security settings, click on *Configure Network Security* in the Configure Wireless screen. The network administrator will supply the necessary security information needed.

If using PEAP or TLS authentication, a certificate file will be needed. This file is generated on the Server Certificate Authority recognized by the Radius server. On the server, open *Control Panel →Internet Options,* choose the *Content* tab, and press the *Certificates* button. Choose the *Trusted Root Certification Authorities* and locate the server's CA. Select the CA and export it to a .CER file.

If using TLS authentication, in addition to the certificate file, private and public keys are required. Export the User/Client Certificate recognized by the Radius server to a PFX file, then use the OpenSSL utility to convert the PFX file into a private key PEM file and a public key PEM file.

The following screen shows settings for WEP encryption. See the instructions below or the Silex manual for more options. Click *Submit* to save the settings.

Configure Network Security

Encryption Mode	WEP 128 bit ▾	?
Key Selection	1 ▾	?
WEP Key	Key #1: <WEP Key> Key #2: Key #3: Key #4:	?
Wireless Authentication Type	Open System ▾	?
Wired Authentication Type	None ▾	?
Authentication Attempts	0	?
User ID	anonymous	?
Password		?
Authentication Protocol	PAP ▾	?
PSK	**	?
Authentication Server Certificate	Configure Authentication Server Certificate	
SSL/TLS Private Key	Configure Private Key	
	Submit	

Callouts pointing to the screen:
- Enter the encryption mode.
- Enter the WEP key.
- Note that the Wireless Authentication Type is Open even though the access point in this case is set to WEP-Shared Key. *It will not work if set to Shared.*

For WEP encryption, set the *Encryption Mode* to *WEP 64 bit* or *WEP 128 bit*. Enter the *Key Selection* and then enter the *WEP Key*. *Wireless Authentication* **must** be set to *Open System*.

For DWEP encryption, set the *Encryption Mode* to *Dynamic WEP*. The *Wireless Authentication Type* can be either *LEAP* or *EAP-FAST*. Enter the *User ID* and *Password*.

For WPA or WPA2 encryption, set the *Encryption Mode* to *WPA* or *WPA2*. The *Wireless Authentication Type* can be *LEAP*, *PEAP*, *TLS*, *TTLS*, EAP-FAST, or *PSK*. For *PSK* authentication, enter the PSK passphrase, otherwise enter the *User ID* and *Password*. For *PEAP* or *TLS* authentication, load the *Authentication Server Certificate* (.CER file) created previously. In addition, for *TLS* authentication import the private and public keys (.PEM files) created previously.

CHAPTER 6 – TROUBLESHOOTING

When DRCV01 is installed, a new Windows™ service named *DatamedRcv_DRCV01* is created. The service continually monitors the License Key and if it is removed the service will log a message to the Event Log and stop processing. Once the key is connected again the service will resume processing. Note that if the License Key is not connected then the service will not start. The Configurator utility can be used to start, stop, and monitor the service.

The *Sentinel LDK License Manager* service was installed by the license key driver, and it must be running at all times. If the service is reporting that the license key is not present, it might be due to this service being stopped or unresponsive. This can generally be resolved by restarting the service or restarting the Computer. Then check the ACC web page to confirm that the license is available. If the license key needs to be updated, review the steps in the *Updating the License Key* section of *Chapter 2*.

If there is a problem, the first place to look is the *Event Viewer*, which can be accessed from **Control Panel → Administrative Tools** or from the *Tools* menu. Once the viewer is opened, select *Application* from the left side menu and the right side will be filled with the application event log. Double-clicking on any entry in the log will open a window that shows the details for the event. The *Type* column in the log will indicate whether this is an *Information* or *Error* message, and the *Source* column will indicate what service logged the entry. The *Information* messages are normal and for a normal startup there will be two or more from *DatamedRcv_DRCV01* depending on the configuration. The *Error* messages describe problems that have occurred. Reviewing the log entries will give insight into what is working and what is a problem. If the License Key could not be contacted, the service will log an Error message describing the condition.

After the startup message, there should be an event log message that gives the URL that the listener is monitoring and also the directory where files will be written. If a message that should be there is not present, check the configuration settings using the Configurator to confirm that the parameters are correct (see *Chapter 3* for details). In most cases there will be an error message that describes the problem. Most errors are self-explanatory and can be resolved by correcting the setting or condition that caused them.

Here are some common issues and answers:

- **Symptom: The License Key cannot be located or is marked as Cloned**
  - The License Key is required for the *DatamedRcv_DRCV01* service to run. Whether the License Key is attached to the computer directly, attached to the VM's host computer, or connected by network, it must be accessible and a local driver must be installed. To verify that the key is connected, do one (or both) of the following:
    - Start the Configuration Utility and select *Help → About* on the menu. After a moment it should show the license information.

- ▪ Open the ACC from the Start Menu, the Tools menu in the Configurator, or manually opening http://localhost:1947 from a browser. Confirm that there is a line with Location "Local", Vendor "11974", Key Type "HOST SL AdminMode", and a value for Key ID.

  - o For a Hardware License Key there is a light on the physical key that should be on if the driver is working.

  - o If the Security Key still can't be located or is marked as Cloned in the ACC, contact DLLC support.

- • **Symptom: No files are written**

  - o If the service starts properly but no files are received when the originating device makes a transmission, then the communication needs to be checked. DLLC support personnel may need to gather detailed information using the debugging facility. If directed to collect debugging information, follow the directions to enable debugging in *Chapter 3*. The debug file(s) will be created in the output folder and should be sent to DLLC.

  - o Another common problem is that there is a firewall interfering with the incoming transmission. Ensure that the appropriate ports are open.

  - o Check the permissions on the output folder to make sure that the service has write permissions.

- • **Symptom: Connections are not fully closed**

  - o If netstat –a reveals a large number of connections that persist despite the carts closing them then you may need to set the *TcpTimedWaitDelay* parameter. This is accessed using *regedit* to access HKLM\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters. If there is a not a value named *TcpTimedWaitDelay* then create a REG_DWORD value and set it to a number between 30 and 240. More information about this settings is available here: https://technet.microsoft.com/en-us/library/cc938217.aspx.

DLLC support can be reached by email at support@datamed.com or by phone at either (800) 601-3361 ext 2 (within the US) or +1 901 672 6225 ext 2 (outside the US).

APPENDIX A – REGISTRY SETTINGS

If it is necessary to change the settings for DRCV01 after installation, the Configurator utility should be used. There is normally no reason to access the registry editor to make the changes. In the event that DLLC support personnel request it, you can open the registry editor by selecting Start → Run and then type "*regedit*" and press *OK*. When the registry editor opens, navigate the folders to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\DatamedRcv_DRCV01.

Most of the settings must not be changed or the operation of DRCV01 will be affected. If any setting is changed *DatamedRcv_DRCV01* must be restarted.

APPENDIX B – END USER LICENSE AGREEMENT

The current End User License Agreement (EULA) can be found on DLLC's web site here: datamed_eula.pdf. The following EULA was current at the time of this printing but is subject to being replaced by a more current version that is found on the website.

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(viii) Distribute, rent, sell, loan, lease, sublicense, or otherwise deal in the Product and or any other component elements of the Product;

(ix) use the Product to facilitate or perform bulk translations of any electrocardiogram data or any other data that may be processed through the Product; and/or

(x) use the Product on or in connection with an application service provider platform or other hosted website, application or platform, or as a software as a service.

(xi) disclose or allow the disclosure of Personally Identifiable Information, Personal Healthcare Information and/or Personal Data, as may be defined in any applicable law, except as expressed permitted pursuant to applicable law. Notwithstanding anything else to the contrary, you will never disclose such Personally Identifiable Information, Personal Healthcare Information and/or Personal Data to Datamed unless Datamed provides prior written consent to each such disclosure event.

You agree that in the event of actual or threatened breach of this Section by you, Datamed will have no adequate remedy at law and will be entitled to immediate and injunctive and other equitable relief, without bond and without the necessity of showing actual money damages.

5. TERMINATION. Without prejudice to any other rights, Datamed may terminate this EULA immediately and without notice if you fail to comply with any term or condition of this Agreement. Upon such termination your license is terminated immediately and you must immediately cease the use of and destroy all complete and partial copies of the Product, including all backup copies. Sections 4, 8, 9, 10, 11, 13, 14 and this Section 5 shall survive any expiration or termination of this EULA.

6. LIMITED WARRANTY FOR PRODUCT. Datamed warrants that the Product will perform substantially in accordance with the documentation thereof for a period of ninety (90) days from the date of receipt. If support is not provided through the party that distributed the Product to you, extended support and maintenance may be available for purchase from Datamed and shall be subject to such terms and conditions as Datamed may from time to time provide in a separate document or a support and maintenance plan; provided that Datamed's obligations related to the warranty provided herein or such additional support shall be expressly subject to your continued compliance with the terms and conditions of this EULA and the timely payment of any and all amounts owed to Datamed and its affiliates. **THE SOLE REMEDY FOR ANY CLAIMS UNDER THIS WARRANTY IS REPAIR OR REPLACEMENT OF THE PRODUCT, AS DATAMED'S OPTION.**

If an implied warranty or condition is created by your state/jurisdiction and federal or state/provincial law prohibits disclaimer of it, you also have an implied warranty or condition, BUT ONLY AS TO DEFECTS DISCOVERED DURING THE PERIOD OF THIS LIMITED WARRANTY (NINETY DAYS). AS TO ANY DEFECTS DISCOVERED AFTER THE NINETY DAY PERIOD, THERE IS NO WARRANTY OR CONDITION OF ANY KIND. Some states/jurisdictions do not allow limitations on how long an implied warranty or condition lasts, so the above limitation may not apply to you.

Any supplements or updates to the Product, including without limitation, any updates provided to you after the expiration of the ninety day Limited Warranty period are not covered by any warranty or condition, express, implied or statutory.

7. YOUR EXCLUSIVE REMEDY. Datamed's entire liability and your exclusive remedy for any breach of this Limited Warranty or for any other breach of this EULA or for any other liability relating to the Product shall be, at Datamed's option from time to time exercised subject to applicable law, (a) return of the amount paid (if any) for the Product, or (b) repair or replacement of the Product that does not meet this Limited Warranty and that is returned to Datamed. You will receive the remedy elected by Datamed without charge, except that you are responsible for any expenses you may incur. This Limited Warranty is void if failure of the Product has resulted from accident, abuse, misapplication, abnormal use a virus, or violation of any terms in this EULA. Any replacement Product will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer, and Datamed will use commercially reasonable efforts to provide your remedy within a commercially reasonable time of your compliance with Datamed's warranty remedy procedures. Datamed may use electronic means to deliver the product. To exercise your remedy, contact: Datamed by email at support@datamed.com.

8. DISCLAIMER OF WARRANTIES. The Limited Warranty above is the only warranty made to you and is provided in lieu of any other warranties or similar obligations (if any) created by any advertising, documentation, packaging, or other communications. No employee, agent, representative or affiliate of Datamed has authority to bind Datamed to any oral representations or warranty concerning the Product. Any written representation or warranty not expressly contained in this EULA will not be enforceable. EXCEPT FOR THE LIMITED WARRANTY, THE PRODUCT, SOFTWARE, RELATED MATERIALS, DOCUMENTATION AND/OR ANY SERVICES RELATED TO THE PRODUCT, ARE PROVIDED "AS-IS, WITH ALL FAULTS," AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, DATAMED AND ITS SUBSIDIARIES, AFFILIATES, LICENSORS, DISTRIBUTORS, DEALERS OR SUPPLIERS ("REPRESENTATIVES") DISCLAIM ALL OTHER REPRESENTATIONS AND WARRANTIES, EXPRESS OR IMPLIED, REGARDING THE PRODUCT, SOFTWARE, RELATED MATERIALS, CONTENT AND ANY SERVICES, INCLUDING FITNESS FOR A PARTICULAR PURPOSE, SECURITY, QUALITY, MERCHANTABILITY, AND THEIR NON-INFRINGEMENT. DATAMED EXPRESSLY DISCLAIMS ANY REPRESENTATIONS OR WARRANTIES THAT YOUR USE OF THE PRODUCT WILL SATISFY ANY STATUTORY OR REGULATORY OBLIGATIONS, OR WILL ASSIST WITH, GUARANTEE OR OTHERWISE ENSURE COMPLIANCE WITH ANY APPLICABLE LAWS OR REGULATIONS, INCLUDING BUT NOT LIMITED TO THE HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT OF 1996 ("HIPAA") OR OTHER FEDERAL OR STATE STATUTES OR REGULATIONS. YOU ARE SOLELY RESPONSIBLE FOR ENSURING THAT YOUR USE OF THE PRODUCT, RELATED SERVICES OR CONTENT IS IN ACCORDANCE WITH APPLICABLE LAW, INCLUDING WITHOUT LIMITATION THE HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT AND EU'S GENERAL DATA PROTECTION REGULATION. IT IS YOUR RESPONSIBILITY TO KEEP ABREAST OF CHANGES IN LAWS, REGULATIONS AND HEALTHCARE PRACTICES THAT AFFECT YOU AND YOUR BUSINESS. You shall indemnify and hold Datamed harmless from and against any costs, losses, liabilities and expenses (including reasonable attorneys' fees) arising out of any claims related to your use of the Product or violation of this EULA.

9. EXCLUSION OF INCIDENTAL, CONSEQUENTIAL AND CERTAIN OTHER DAMAGES. TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL DATAMED OR ITS OFFICERS, EMPLOYEES, AGENTS OR REPRESENTATIVES BE LIABLE FOR ANY SPECIAL, INCIDENTAL, PUNITIVE, EXPECTATION, INDIRECT, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFITS, LOSS OF DATA OR CONFIDENTIAL OR OTHER INFORMATION, FOR BUSINESS INTERRUPTION, FOR PERSONAL INJURY, FOR LOSS OF PRIVACY, FOR FAILURE TO MEET ANY DUTY INCLUDING OF GOOD FAITH OR OF REASONABLE CARE, FOR NEGLIGENCE, AND FOR ANY OTHER PECUNIARY OR OTHER LOSS WHATSOEVER) ARISING OUT OF OR IN ANY WAY RELATED TO THE USE OF OR INABILITY TO USE THE PRODUCT, THE PROVISION OF OR FAILURE TO PROVIDE SUPPORT OR OTHER SERVICES, INFORMATION,

SOFTWARE, AND RELATED CONTENT THROUGH THE PRODUCT OR OTHERWISE ARISING OUT OF THE USE OF THE PRODUCT, OR OTHERWISE UNDER OR IN CONNECTION WITH ANY PROVISION OF THIS EULA, EVEN IN THE EVENT OF THE FAULT, TORT (INCLUDING NEGLIGENCE), MISREPRESENTATION, STRICT LIABILITY, BREACH OF CONTRACT OR BREACH OF WARRANTY OF DATAMED OR ANY REPRESENTATIVE, AND EVEN IF DATAMED OR ANY REPRESENTATIVE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

10. LIMITATION OF LIABILITY AND REMEDIES. NOTWITHSTANDING ANY DAMAGES THAT YOU MIGHT INCUR FOR ANY REASON WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ALL DAMAGES REFERENCED HEREIN AND ALL DIRECT OR GENERAL DAMAGES IN CONTRACT OR ANYTHING ELSE), THE ENTIRE LIABILITY OF DATAMED AND ANY OF ITS OFFICERS, EMPLOYEES, AGENTS OR REPRESENTATIVES UNDER ANY PROVISION OF THIS EULA AND YOUR EXCLUSIVE REMEDY HEREUNDER (EXCEPT FOR ANY REMEDY OF REPAIR OR REPLACEMENT ELECTED BY DATAMED WITH RESPECT TO ANY BREACH OF THE LIMITED WARRANTY) SHALL BE LIMITED TO THE LESSER OF (I) THE ACTUAL DAMAGES YOU INCUR IN REASONABLE RELIANCE ON THE PRODUCT OR (II) THE LICENSE FEES ACTUALLY PAID BY YOU FOR THE PRODUCT. THE FOREGOING LIMITATIONS, EXCLUSIONS AND DISCLAIMERS (INCLUDING WITHOUT LIMITATION SECTIONS 8, 9, 10 AND 11) SHALL APPLY TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EVEN IF ANY REMEDY FAILS ITS ESSENTIAL PURPOSE. THE DISCLAIMERS AND LIMITATIONS ON LIABILITY SET FORTH ABOVE ARE FUNDAMENTAL ELEMENTS OF THE BASIS OF THE AGREEMENT BETWEEN DATAMED AND YOU.

11. Export Restrictions. You acknowledge and agree that the Product is subject to restrictions and controls imposed by the Export Administration Act of 1979, as amended, and the Export Administration Regulations thereunder ("the Acts"). You agree and certify that neither the Product nor any direct product thereof is being or will be used for any purpose prohibited by the Acts. You further agree and certify that neither the Datamed Product nor any direct product thereof will be exported to countries which are currently subject to U.S. trade embargoes or (ii) persons or entities on the U.S. "Denied Persons List", "Specially Designated Nationals List" and "Entities List".

12. U.S. GOVERNMENT LICENSE RIGHTS. All Product provided to the U.S. Government pursuant to U.S. Government solicitations, task orders, purchase orders, or other procurement are provided with the same (neither greater or lesser) commercial license rights and restrictions described elsewhere herein, except that, where the contract resulting from any such procurement contains the clause at FAR 52.227-19 (Commercial Computer Software License) (DEC 2007), the U.S. Government will have the rights set forth in paragraph (b) of that clause.

13. APPLICABLE LAW. This EULA is governed exclusively by the laws of the State of Tennessee, USA. The state and federal courts located in Davidson County, Tennessee shall have exclusive jurisdiction to adjudicate any dispute arising out of or relating to this Agreement.

14. ENTIRE AGREEMENT; SEVERABILITY. This EULA (including any addendum or amendment to this EULA which is included with the Product) is the entire agreement between you and Datamed relating to the Product and the support services (if any) and they supersede all prior or contemporaneous oral or written communications, proposals and representations with respect to the Product or any other subject matter covered by this EULA. This EULA sets forth the entire liability of Datamed and its representatives and your exclusive remedy with respect to the Product and services and their use. To the extent the terms of any Datamed policies or programs for support services conflict with the terms of this EULA, the terms of this EULA shall control. Any waiver of the terms herein by Datamed must be in a writing signed by an authorized officer of Datamed and expressly referencing the applicable provisions of this EULA. If any provision of this

EULA is held to be void, invalid, unenforceable or illegal, it shall be enforced to the extent permissible and all other provisions shall continue in full force and effect. Headings are included for convenience only, and shall not be considered in interpreting this Agreement. This EULA does not limit any rights that Datamed may have under trade secret, copyright, patent or other laws.

The following Datamed GUARANTEE applies to you if you acquired this Product in any country other than the United States:

Statutory rights not affected - The following guarantee is not restricted to any territory and does not affect any statutory rights that you may have from your reseller or from Datamed if you acquired the Product directly from Datamed. If you acquired the Product or any support services in Australia, New Zealand or Malaysia, please see the "Consumer rights" section below.

The Guarantee - The Product is designed and offered as one of Datamed's Datamed® products. You accept that no Product is error free and you are strongly advised to back-up your files regularly. Provided that you have a valid license, Datamed guarantees that a) for a period of 90 days from the date of receipt of your license to use the Product or the shortest period permitted by applicable law it will perform substantially in accordance with any written materials that accompany the Product; and b) any support services provided by Datamed shall be substantially as described in applicable written materials provided to you by Datamed and Datamed's support engineers will use reasonable efforts, care and skill to solve any problem issues. Acknowledging that Datamed has limited support resources, all support will be done remotely from Datamed's home location. In the event that the Product fails to comply with this guarantee, Datamed will, at its sole option), either (a) repair or replace the Product or (b) return the price you paid. This guarantee is void if failure of the Product results from accident, abuse, misapplication, or violation of any terms of this EULA. Any replacement Product will be guaranteed for the remainder of the original guarantee period or 30 days, whichever period is longer. You agree that the above guarantee is your sole guarantee in relation to the Product and any support services.

Exclusion of All Other Terms - To the maximum extent permitted by applicable law and subject to the guarantee above, Datamed disclaims all warranties, conditions and other terms, either express or implied (whether by statute, common law, collaterally or otherwise) including but not limited to implied warranties of satisfactory quality and fitness for particular purpose with respect to the Product and any written materials that accompany the Product. Any implied warranties that cannot be excluded are limited to 90 days or to the shortest period permitted by applicable law, whichever is greater.

Limitation of Liability - To the maximum extent permitted by applicable law and except as provided in the Datamed Guarantee, Datamed and its Representatives shall not be liable for any damages whatsoever (including without limitation, damages for loss of business profits, business interruption, loss of business information or other pecuniary loss) arising out of the use or inability to use the Product, even if Datamed has been advised of the possibility of such damages. In any case Datamed's entire liability under any provision of this EULA shall be limited to the amount actually paid by you for the Product. These limitations do not apply to any liabilities that cannot be excluded or limited by applicable laws.

Consumer Rights - Consumers in Australia, New Zealand or Malaysia may have the benefit of certain rights and remedies by reason of the Trade Practices Act and similar state and territory laws in Australia, the Consumer Guarantees Act in New Zealand and the Consumer Protection Act in Malaysia in respect of which liability cannot lawfully be modified or excluded. If you acquired the Product in New Zealand for the purposes of a business, you confirm that the Consumer Guarantees Act does not apply. If you acquired the Product in Australia and if Datamed breaches a condition or warranty implied under any

law which cannot lawfully be modified or excluded by this EULA then, to the extent permitted by law, Datamed's liability is limited, at Datamed's option, to: (i) in the case of the Product: a) repairing or replacing the Product; or b) the cost of such repair or replacement; and (ii) in the case of support services: a) re-supply of the services; or b) the cost of having the services supplied again.

Should you have any questions concerning this EULA, or if you desire to contact Datamed for any reason, please use the address information enclosed in this Product to contact Datamed directly or visit Datamed on the World Wide Web at http://www.datamed.com.

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