DatamedWL™
Service Manual

Datamed LLC
DatamedWL™ v3.2
Doc ID DMD-10500-00900 Rev C
Apr 2025

WARRANTY
Datamed LLC ("*DLLC*") makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The software described herein is covered by DLLC's standard EULA, which is available on DLLC's website (www.datamed.com).

CAUTIONS
This product is not intended for home use.

REGULATORY
This product is not a medical device.

Manufactured and distributed by:
Datamed LLC
Brentwood, TN
USA
US: +1 800 601-3361
Int'l: +1 901 672 6225
Fax: +1 901 672 6331
www.datamed.com

TRADEMARKS

The following marks are the registered trademarks of their respective owners. These marks are used for informational use only and do not imply any endorsement or approval by their respective owners.

Owner	*Trademark(s)*
Carestream Health, Inc.	***Carestream***
Cerner Corporation	***PowerChart***
Change Healthcare	***Change Healthcare Operations, LLC***
Datamed LLC	***Datamed***
Digi International, Inc.	***AnywhereUSB***
Edan Instruments, Inc.	***Edan***
Esaote, S.p.A.	***Esaote***
Fujifilm Medical Systems USA Inc	***Synapse***
GE Medical Systems Information Technologies, Inc	***MAC*** and ***MUSE***
General Electric Company	***GE***
Koninklijke Philips Electronics	***Philips, IntelliVue, IntelliSpace,*** and ***PageWriter***
Microsoft Corporation	***Microsoft*** **and** ***Windows Server***
Mortara Instrument, Inc	***Mortara, ELI, Burdick***, and ***Pyramis***
National Electrical Manufacturers Association Corporation	***DICOM***
Nihon Kohden Corporation	***Cardiofax*** and ***Nihon Kohden***
Novarad Corporation	***NovaCardio*** and ***Novarad***
SafeNet Data Security Ltd.	***HASP***
Schiller Holding AG	***CARDIOVIT***
ScImage, Inc	***ScImage*** *and* ***PICOM***
Welch Allyn, Inc	***Welch Allyn***

Intended Use

This product is middleware that sits between a DEVICE (an EKG acquisition device that will query for orders) and a SYSTEM (a system that contains the EKG orders). Its primary purpose is to be a seamless conversion conduit between these two and allow the DEVICE to send a native query to the SYSTEM and then receive back a list of orders. From the DEVICE's perspective, it is emulating a SYSTEM from the same manufacturer; from the SYSTEM's perspective it is emulating a DEVICE from the same manufacturer. The secondary purpose is to act as a receiver and (optionally) a transmitter for the one-way EKG transmission from the DEVICE to the SYSTEM, using DatamedFT™ for conversion. It is not intended to be used for any other purposes than those described here.

Protected Health Information (PHI) Considerations

This product is not intended as a permanent data store, but in the normal course of operation certain data elements can be stored locally, including PHI. 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. This data is always encrypted.
- Windows® Registry - When combined with DatamedFT™, context information (which may contain PHI) can be stored in the registry in the DynamicFieldMappingByOrderID subkey off the DatamedFT service process key.

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 server with only software related to this one such as other Datamed modules and vendor-provided software like Mortara ELI® Link.
- 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

The DatamedWL™ application (***"DWL"***) provides order query functionality between EKG acquisition devices (normally cardiographs) and storage/management systems. To use this functionality, the device operator utilizes that device's query mode (which typically includes search criteria) and initiates an order query (worklist) request. That request goes to DWL and is then converted to the appropriate type of query for the management system. If the system has any orders that match the search criteria, the information (order information, patient demographics) is returned to DWL where it is then passed back to the source device. DWL appears as native management system to the source device, and it appears as a native source device to the management system. Typically, once the worklist is retrieved, an EKG will be taken and sent through DFT to the management system to close the order.

Not all EKG devices support worklist functionality and not all that do are supported by DWL. Check the compatibility list on www.datamed.com or contact Datamed LLC to find out if your specific device is supported.

DWL is licensed for a specific number of source devices. Licenses can be purchased and added at any time.

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

DEVICE	For clarity, this term is used to indicate the EKG acquisition device that will query for orders
DFT	DatamedFT™ Format Translator
DLLC	Datamed LLC
DRCV01	DatamedRcv™ Model DRCV01
DRCV02	DatamedRcv™ Model DRCV02
DWL	DatamedWL™
SYSTEM	For clarity, this indicates the system that contains the EKG orders
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	DatamedWL 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.
  - A Software License Key is activated on a specific computer and locked to that computer. This is normally used for VMs.
  - 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. In a standard installation DFT v3.0 or higher is required for DWL to function properly, so it should either be installed already or be installed subsequent to this installation.
  - For customers with GE® MAC® cardiographs, DWL will handle communications with worklist-capable models, and DRCV01 will handle communications with non-worklist-capable models. If all of the GE® MAC® carts are worklist-capable then DRCV01 should not be installed. If both are installed, DWL and DRCV01 must be configured to listen on different ports.
  - For customers using worklist functionality with Philips PageWriter® cardiographs, DWL will handle communications with worklist-capable models, and DRCV02 will handle communications with non-worklist-capable models. If the system will also be used with IntelliVue monitors and PIIC iX, DRCV02 can be installed on the Computer and configured to listen on a port other than port 80. The PIIC must be configured to transmit on the same port.

- **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.
- **LAN considerations.** DWL only communicates over a LAN. Depending on the DEVICEs and SYSTEM supported, certain ports must be enabled on the Computer and in any relevant firewalls. If DWL is installed on the SYSTEM, it will write files or transmit locally. Otherwise, it will be configured to transmit or write output files across the network to the SYSTEM, so that traffic must be allowed.

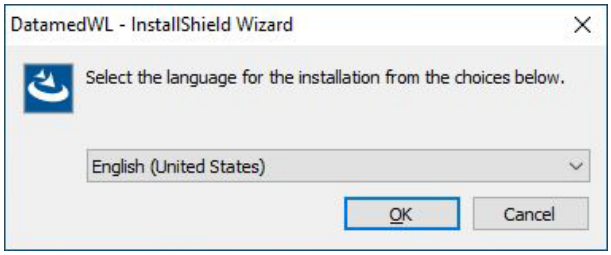
New Software Installation

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

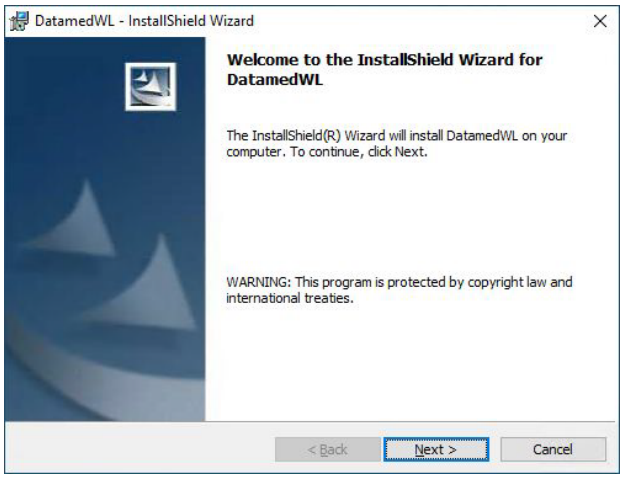
NOTE: DWL v1.x cannot be directly upgraded to v3.x. To upgrade from v1 to v3 follow the Updating instructions later in this chapter.

Step 1: Install the DWL software

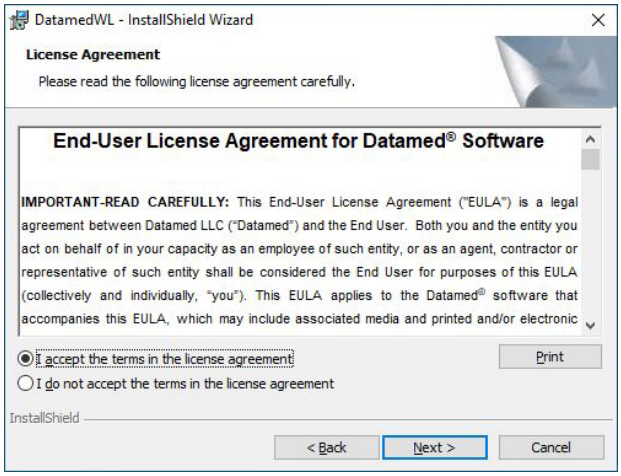
- The installer will be delivered as a download link. After downloading, double click on *DatamedWL_Setup_v3.x.x.exe*. The following screen should appear. Select the appropriate language and then click ***Next*** to continue.



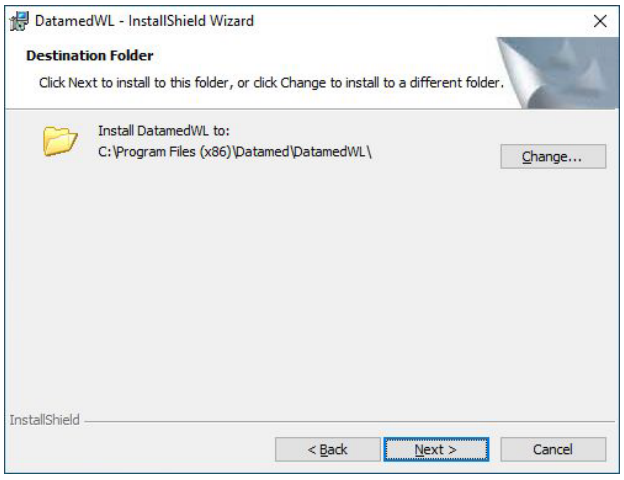
- The introduction screen will appear. Click ***Next*** to continue.



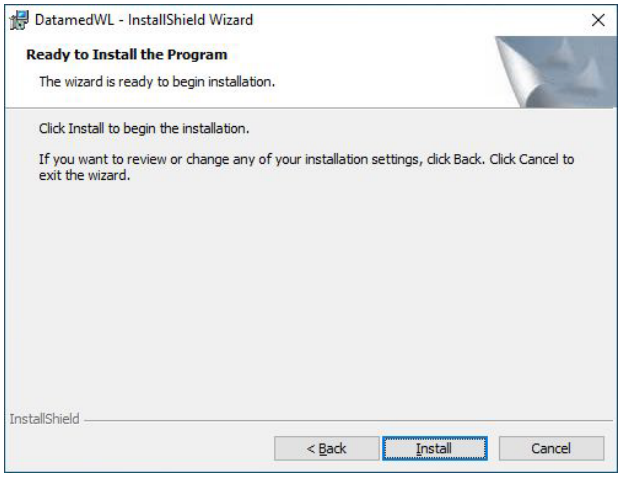
- Read the License Agreement carefully. ***IMPORTANT: THIS EULA IS A BINDING CONTRACT BETWEEN THE ORGANIZATION (END USER) AND DATAMED LLC FOR THE USE OF THE SOFTWARE. THE TECHNICIAN INSTALLING THE SOFTWARE MUST HAVE THE AUTHORITY TO ACCEPT A CLICK-THROUGH CONTRACT ON BEHALF OF THE ORGANIZATION.*** Once you confirm this authority and review the license, select ***I accept the terms in the license agreement*** and then click ***Next*** to continue.



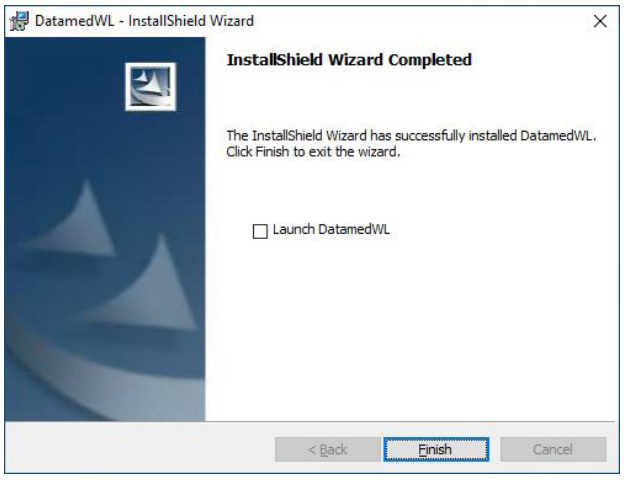
- Select the installation folder for the program (normally the default location) and then click ***Next*** to continue.



- 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 DatamedWL*** 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

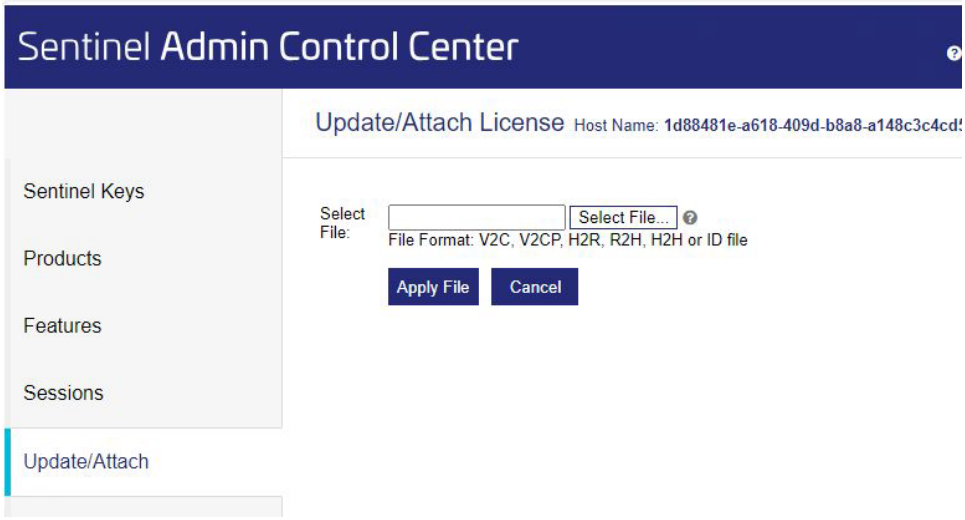
- The license key driver and the Software License Key (if applicable) will only be installed and activated once on the Computer, regardless of how many Datamed suite applications are installed. If the license has already been activated with a previous module such as DFT then skip to the next step.
- To install the license key driver, open the Start Menu and locate *DatamedWL → 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:

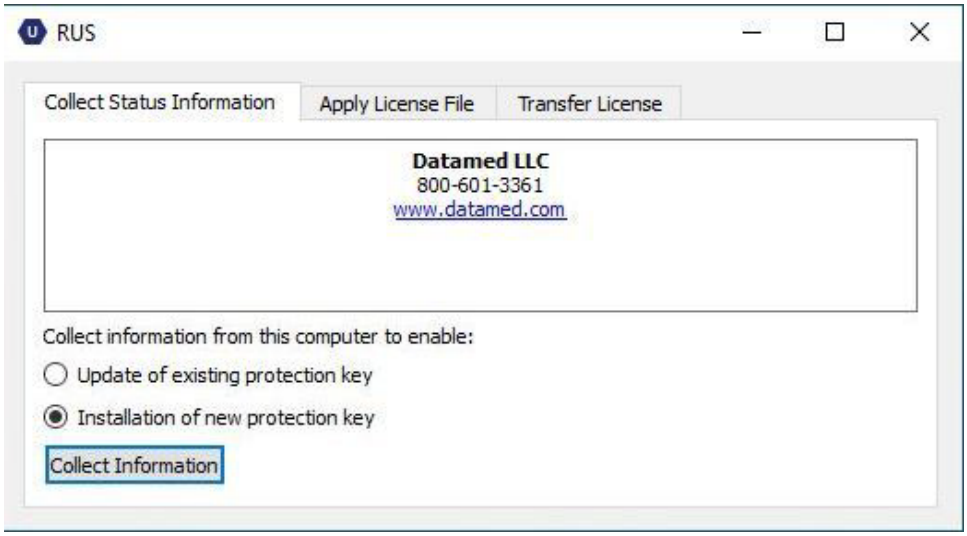
  a. Open the ACC and go to *Sentinel Keys*. If the driver and DLLC library were installed properly then there will be a line with Location "Local", Vendor "11974", Key Type "Reserved for New SL Key", and Configuration "SL". Click the **Fingerprint** button to the right to generate a fingerprint file (.c2v). 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.

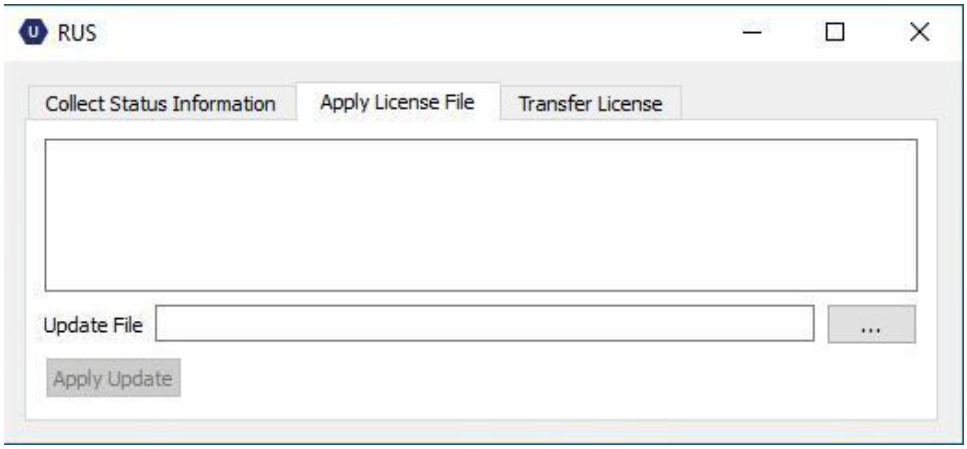


- To use the standalone *Sentinel License Utility*:

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

If DWL 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 DWL v1.x is installed, follow these steps:

- Stop the *DatamedWL* and *DatamedWLStart* 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

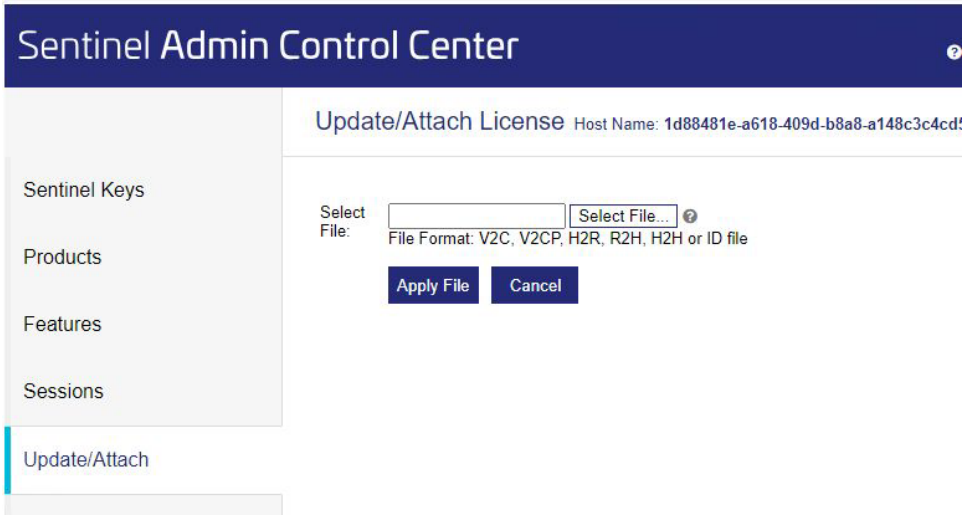
To uninstall DWL, do one of the following: 1) from the Start Menu locate *DatamedWL → Uninstall DatamedWL* and select it; or 2) open *Control Panel*, choose *Add or Remove Programs*, select *DatamedWL*, and press the *Remove* button. In either case the application will be removed. It may take a minute 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.

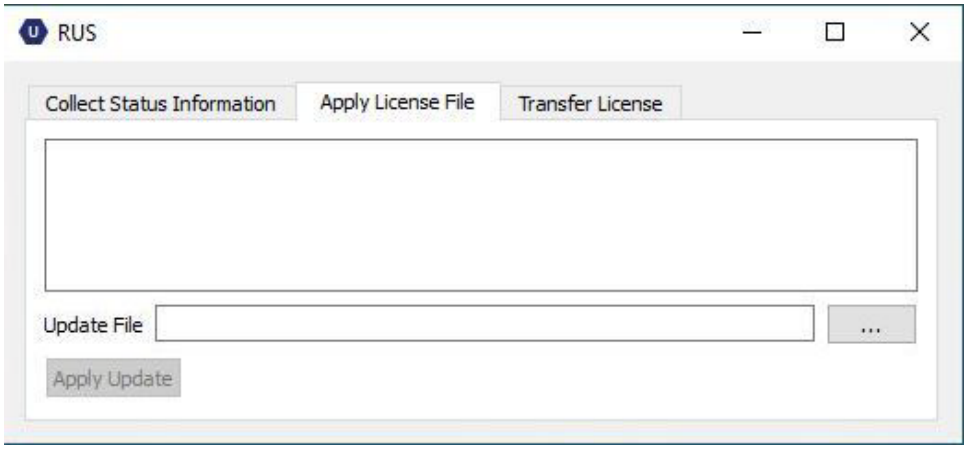
Applying an update using the ACC

- 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 then the configuration settings will already be set up and should not need to be changed. However, for a new installation the configuration settings will need to be set up. Even if a configuration file was supplied, certain settings require specific IP addresses or DNS names that are not known to DLLC in advance. Configuration settings are changed by using the DatamedWLConfig utility. A shortcut to this utility will be found on the desktop, and it can also be found on the Start Menu under *DatamedWL → DatamedWL 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 *DatamedWL* 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 DatamedWL start= delayed-auto
```

It is very important to make sure that all of the configured folders are created before starting the service. The default folders shown are *not* automatically created during installation. Missing or invalid folders will be highlighted in yellow in the Configurator.

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

Unless only order query functionality is used, DFT is required to be present and running for this application to work. **DFT should always be installed before DWL because certain configuration settings are not available in DWL if DFT is not installed.** See *Chapter 7* for more information about setting up DFT for use with DWL.

CHAPTER 3 – CONFIGURING DATAMEDWL™

Once DWL is installed, changes to the configuration settings can be done using the DatamedWLConfig 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. As DWL supports multiple simultaneous processes; settings for each process are configured separately. Note that more processes can be configured than are licensed; however only the number of licenses and formats actually purchased will run. When configuration changes are made, they must be saved and then the service must be restarted for them to take effect. ***NOTE: Depending on the security settings, extra permissions may be required to write to the registry. With UAC enabled, running the application should request elevated privileges.***

Window Settings

At the top of the window there are three items:

- ***Process number***. This selection box indicates which process is currently displayed in the detail tabs. Clicking a different process number in the drop-down list will display the settings for that process.
- ***Enable this process***. Normally all configured processes are enabled, however it may be desirable to temporarily disable a process. Consider the following example: a customer has purchased a single translator license and has configured it. If they would like to test some settings and be able to switch back and forth, they could set up Process #2 with the new settings, and then enable first one and then another. Note that since they have one license, if both processes are enabled then only the first (Process #1) would run. Keep in mind that DFT would need the same 2 processes for this to work.
- ***Total configured processes***. This controls the number of processes in the drop-down list for *Process Number*. It is normally the same as the number of translator licenses, but the previous example shows that this may be altered as needed.

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

- ***Service Status***. This shows the current status of the *DatamedWL* 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 *DatamedWL* service.

- ***Stop***. This button will stop the *DatamedWL* 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.

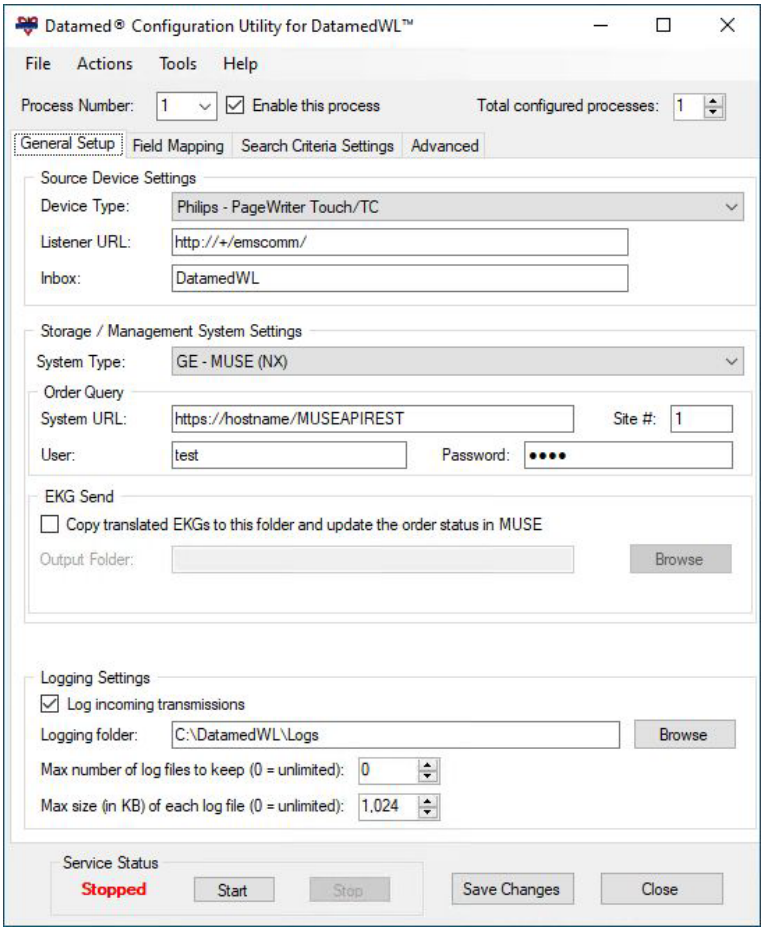
Menu Options

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 DatamedWL Settings (.dwl) 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 DatamedWL Settings (.dwl) file. This file should not be edited manually. Typically this functionality is used to send the configuration settings to DLLC for troubleshooting.
- ***File → Exit***. This is the same as clicking the *Close* button.
- ***Action → Clear Context Storage***. Context data is stored in the registry under the DatamedFT service entry in a subkey named DynamicFieldMappingByOrderID. This is aged automatically but it can be manually cleared by selecting this menu option.
- ***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: General Setup

This tab contains the primary settings for the selected *Process Number*, including device and system types. Most customers will only need to use this tab. Each setting is described below.



Input Settings:

- ***Device Type***. This is a drop-down list of all DEVICEs that are licensed. When this selection is made, the rest of this group of controls will change to one of the following:

  Specific settings for Device Type ***DICOM***:

  - ***C-Find AE Title***. This is the AE Title for DWL when acting as a DICOM SCP (Service Class Provider) that will service the C-FIND request.
  - ***Port***. This is the port that DWL is listening on for C-FIND requests.

- ***C-Store AE Title***. This is the AE Title for DWL when acting as a DICOM SCP (Service Class Provider) that will service the C-STORE request.
- ***Port***. This is the port that DWL is listening on for C-STORE requests.

Specific settings for Device Type ***Edan - SE***:

- ***Listener IP***. This is the IP address of this computer.
- ***Port***. This is the port that DWL is listening on for order requests from the DEVICE.
- ***EKG Input Folder***. This is the folder that will be monitored for incoming EKG files. The FTP server must be configured to write to this folder, which must be a local folder. The ***Browse*** button allows you to browse for the folder to use (or create one).

Specific settings for Device Type ***GE - MAC (Carts connect to DWL listener)***:

- ***Listener IP***. This is the IP address of this computer.
- ***Port***. This is the port that DWL is listening on for connections from GE® carts.

Specific settings for Device Type ***GE - MAC (DWL connects to each cart)***:

- ***Cart Addresses***. This is a list containing the IP Address and port for each GE® cart that will be connected with the built-in LAN port. Connections are initiated by this application. The format of each entry is:
  <IP Address>:<Port>
- ***Validate***. Pressing this button will validate each entry in the *Cart Addresses* list and remove any that are not the right format. **NOTE: This does not validate the connection to the cart.**

Specific settings for Device Type ***GE - MAC (DCP + WebAPI)***:

- ***Communication (DCP) Listener URL***. This is the URL listener that will be configured in the cart's Communications setup. NOTE: Some firmware versions only support http for this interface.
- ***Orders (WebAPI) Listener URL***. This is the URL listener that will be configured in the cart's Orders setup. This can be the same as the DCP URL. The cart can use http or https for this interface.

Specific settings for Device Type ***Mortara - Burdick Atria***:

- ***Listener URL***. This is the URL that the Atria cardiographs will connect to. This value must match the configuration setting in the carts.

Specific settings for Device Type ***Mortara - Eclipse Premier***:

- ***Listener IP***. This is the IP address of this computer.

- ***Port***. This is the port that DWL is listening on for connections from Eclipse™ Premier carts.

Specific settings for Device Type ***Mortara - ELI-series***:

- ***C-Find AE Title***. This is the AE Title for DWL when acting as a DICOM SCP (Service Class Provider) that will service the C-FIND request from ELI® Link.
- ***Port***. This is the port that DWL is listening on for C-FIND requests from ELI® Link.
- ***EKG Input Folder***. This is the folder that will be monitored for incoming EKG files. ELI® Link will be configured to write XML-MI or DICOM files to this folder, which must be a local folder. The ***Browse*** button allows you to browse for the folder to use (or create one).

Specific settings for Device Type ***Nihon Kohden Cardiofax ECG***:

- ***Input Folder***. This is the folder that will be monitored for incoming order requests and EKG files. The EctpCore service must be configured to write to this folder, which must be a local folder. The ***Browse*** button allows you to browse for the folder to use (or create one).

Specific settings for Device Type ***Philips - PageWriter Touch/TC***:

- ***Listener URL***. This is the URL that the Philips PageWriter® cardiographs will connect to. This value must match the configuration setting in the carts.
- ***Inbox***. This is a search criteria used by the Philips PageWriter® cardiographs and is typically used to specify the department. This value is supplied to the cart. Normally only one value is entered, however multiple entries can be entered when separated by a comma. See *Chapter 5* for more details.

Specific settings for Device Type ***SCHILLER - CARDIOVIT***:

- ***Listener URL***. This is the URL that the SCHILLER cardiographs will connect to. This value must match the configuration setting in the carts.

Specific settings for Device Type ***Welch Allyn - CP150 with DICOM option***:

- ***C-Find AE Title***. This is the AE Title for DWL that will service the C-FIND request.
- ***Port***. This is the port that DWL is listening on for C-FIND requests.
- ***C-Store AE Title***. This is the AE Title for DWL that will service the C-STORE request.
- ***Port***. This is the port that DWL is listening on for C-STORE requests.

Storage / Management System Settings:

- ***System Type***. This is a drop-down list of the SYSTEM(s) that are licensed. When this selection is made, the rest of this group of controls will change.
- ***Order Query***. These settings are used for the query.

  Specific settings for System Type ***Carestream - Cardiology PACS***, ***Cerner - PowerChart ECG***, ***Change Healthcare Cardiology***, ***DICOM (generic)***, ***Epiphany Cardio Server***, ***Esaote Suitestensa***, ***INFINITT Cardiology PACS***, ***Lumedx HealthView ECG Manager***, ***Medimatic - ComPACS***, ***Novarad - NovaCardio ECG***, or ***ScImage PicomEnterprise***:

  - ***System AE Title***. This is the AE Title of the DICOM SCP (Service Class Provider) that will service the C-FIND request.
  - ***Local AE Title***. This is the AE Title for DWL when acting as an SCU (Service Class User) making the C-FIND request.
  - ***IP Address*** and ***Port***. This is the host name or IP address and the port for the DICOM SCP that will service the C-FIND request.
  - ***Modality***. This is the modality that will be queried for. It is always "ECG" but can be changed if needed.
  - ***Test***. When this button is pressed it will generate a DICOM ECHO transmission to confirm that the server is available and listening.

  Specific settings for System Type ***GE - MUSE (v7,v8,v9)*** or ***GE - MUSE (NX)***:

  - ***System URL***. This is the URL to the MUSE® server.
  - ***Site #***. This is the Site on MUSE® that will be queried. This must be the same as the *InstitutionID* field mapping in DFT. If this is set to 0 then the *InstitutionID* value in the incoming order request will be used.
  - ***User*** and ***Password***. These are the user and password values sent to the MUSE® server for authentication.

  Specific settings for System Type ***Mortara (CSC) - Pyramis***:

  - ***System URL***. This is the URL to the Pyramis™ server.
  - ***Workstation ID***. This value is sent to the Pyramis™ server during registration.
  - ***Test***. This button initiates a connection to the Pyramis™ server to test the connection settings.
  - ***Inst ID***. This value is sent to the Pyramis™ server during registration.
  - ***Register***. This button will use the configured parameters (including *Workstation ID*) to register DWL with the Pyramis™ server. This must be

done once before any other activity can be done. The button text is red until the registration is done, then it turns green.

Specific settings for System Type ***Philips - IntelliSpace ECG*** or ***Philips - TraceMasterVue***:

- ***System URL***. This is the URL to the Philips server.
- ***User*** and ***Password***. These are the user and password values sent to the server for authentication.

- ***EKG Send***. These settings are used when sending the EKG that was recorded.

  Specific settings for System Type ***Carestream - Cardiology PACS***, ***Cerner - PowerChart ECG***, ***DICOM (generic)***, ***INFINITT Cardiology PACS***, ***Medimatic - ComPACS***, ***Novarad - NovaCardio ECG***, or ***ScImage PicomEnterprise***:

  - ***Transmit EKG after translation***. This controls what happens after the EKG is converted by DFT. If it is checked then the converted file is picked up and transmitted to the SYSTEM. If not, then DWL is done with the EKG. This selection also controls the rest of the controls in this group: if checked then they are enabled, otherwise they are disabled.
  - ***System AE Title***. This is the AE Title of the DICOM SCP (Service Class Provider) that will service the C-STORE request.
  - ***Local AE Title***. This is the AE Title for DWL when acting as an SCU (Service Class User) making the C- STORE request.
  - ***IP Address*** and ***Port***. This is the host name or IP address and the port for the DICOM SCP that will service the C- STORE request.
  - ***Test***. When this button is pressed it will generate a DICOM ECHO transmission to confirm that the server is available and listening.

  Specific settings for System Type ***GE - MUSE (v7,v8,v9)*** or ***GE - MUSE (NX)***:

  - ***Copy translated EKGs to this folder and update the order status in MUSE***. This controls what happens after the EKG is handed off to DFT. If it is checked then the converted file is picked up and written to the SYSTEM. If not then DWL is done with the EKG. For MUSE® 8 and 9 this causes DWL to update the order status in MUSE®. This selection also controls the rest of the controls in this group: if checked then they are enabled, otherwise they are disabled.
  - ***Output Folder***. This is the shared folder on the SYSTEM server where converted files are written to. The ***Browse*** button allows you to browse for the folder to use (or create one).

  Specific settings for System Type ***Mortara (CSC) - Pyramis***:

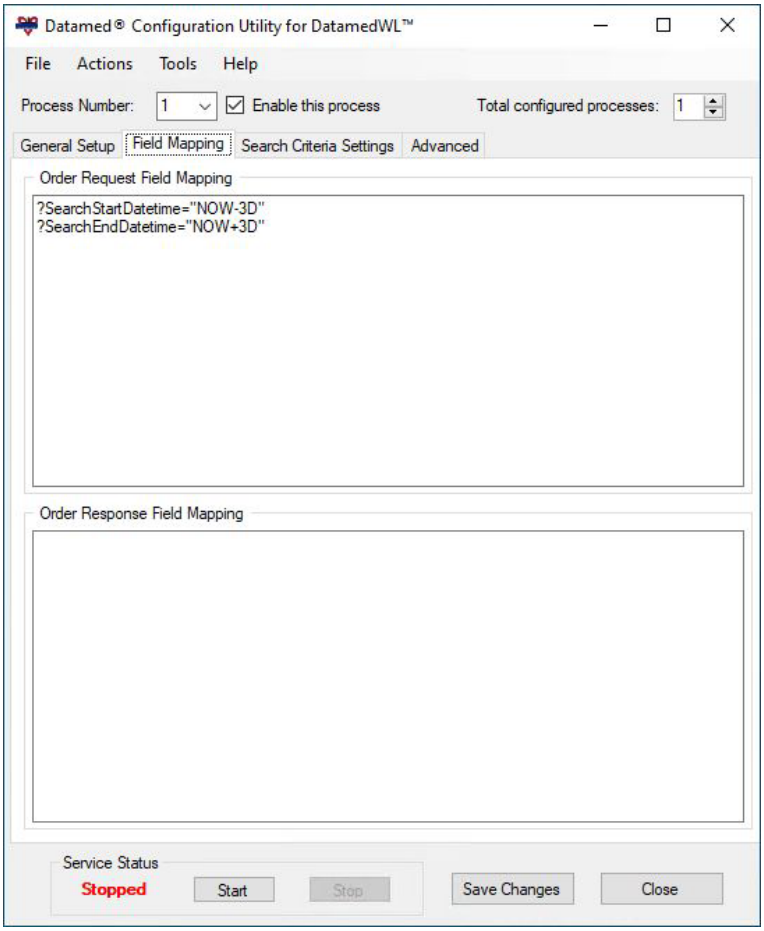
- ***Transmit EKG after translation***. This controls what happens after the EKG is handed off to DFT. If it is checked then the converted file is picked up and transmitted to the SYSTEM. If not, then DWL is done with the EKG.

Logging Settings:

- ***Log incoming transmissions***. This setting enables the collection of basic statistical information in a log file. This file is user-readable and contains time-stamped entries for each query and sent EKG. If there is a problem with a file translation it will be noted in this log. ***It is recommended that logging be turned on***.
- ***Logging folder***. The folder that the log files are created in. The ***Browse*** button allows you to browse for the folder to use (or create one).
- ***Max number of log files to keep (0 = unlimited)***. This is used to control the amount of disk space used for log files. Each time the DatamedWL service is started or when the maximum size is reached (see below) a new log file is created. As each new file is created, a check is made to make sure the total number of files does not exceed this value. If it does, the oldest file is aged out (deleted). The default setting is to disable the checking, which (as indicated by the label) is a setting of zero (0).
- ***Max size (in KB) of each log (0 = unlimited)***. This is also used to control the amount of disk space used for log files. As entries are written to the current log file, the size is checked to make sure it does not exceed the maximum. If it does, the file is closed and new file is created. The file size is specified in kilobytes (1,024 bytes) and the default setting is 1,024K (1MB). As indicated by the label, setting this to zero (0) will disable the checking.

Tab: Field Mapping

This tab contains the field mapping entries for the selected *Process Number*. Each mapping entry must be on a separate line. See *Chapter 4* for a complete description of the field mapping and syntax.

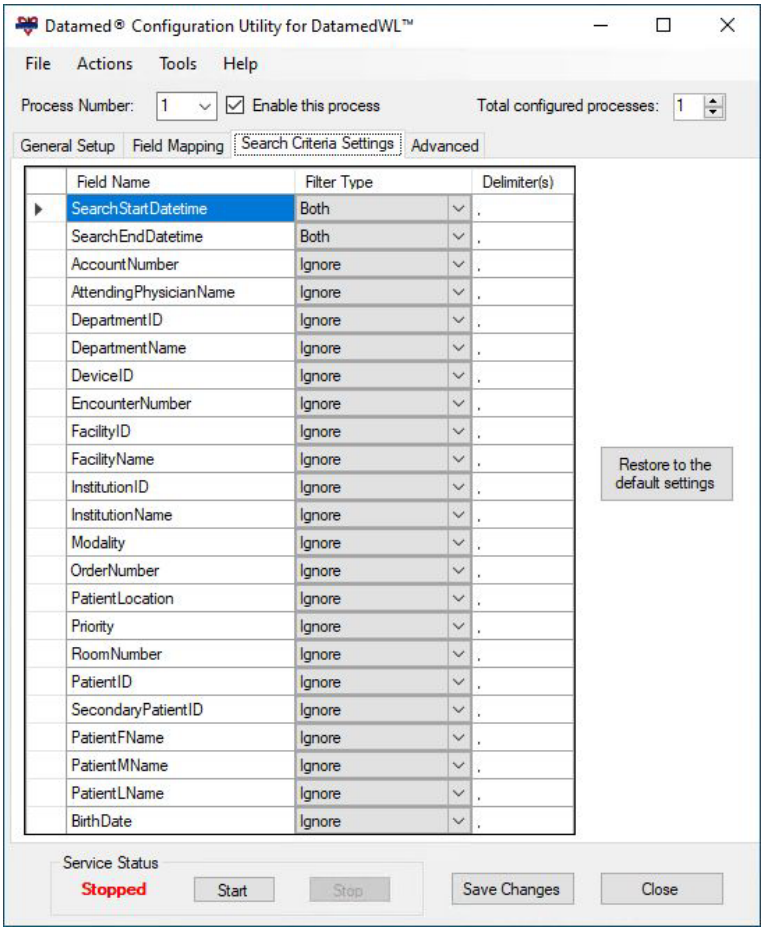


Field Mapping Settings:

- ***Order Request Field Mapping***. These mappings are applied to each incoming Order Request from the DEVICE. *NOTE: The two entries shown above for the search date range are filled in by default and should only be edited, not removed.*
- ***Order Response Field Mapping***. These mappings are applied to each Order Response that came from the SYSTEM. Be very careful with these because they will apply to ***every*** order returned from DWL.

Tab: Search Criteria

This tab allows detailed control of the search criteria functionality for the selected *Process Number*.



Search Criteria Settings:

- The list shows all of the internal fields that can be used as criteria in the Order Query. The criteria are inclusive filters, meaning that orders with matching criteria will be returned and others will be discarded. It is important to note that each SYSTEM supports only a subset of these fields and if a field is not supported in the query to the SYSTEM then it will only be supported internally. Here is a description of each column in the list:
    a. ***Field Name*** is the internal field name (from *Chapter 4*) and cannot be changed.

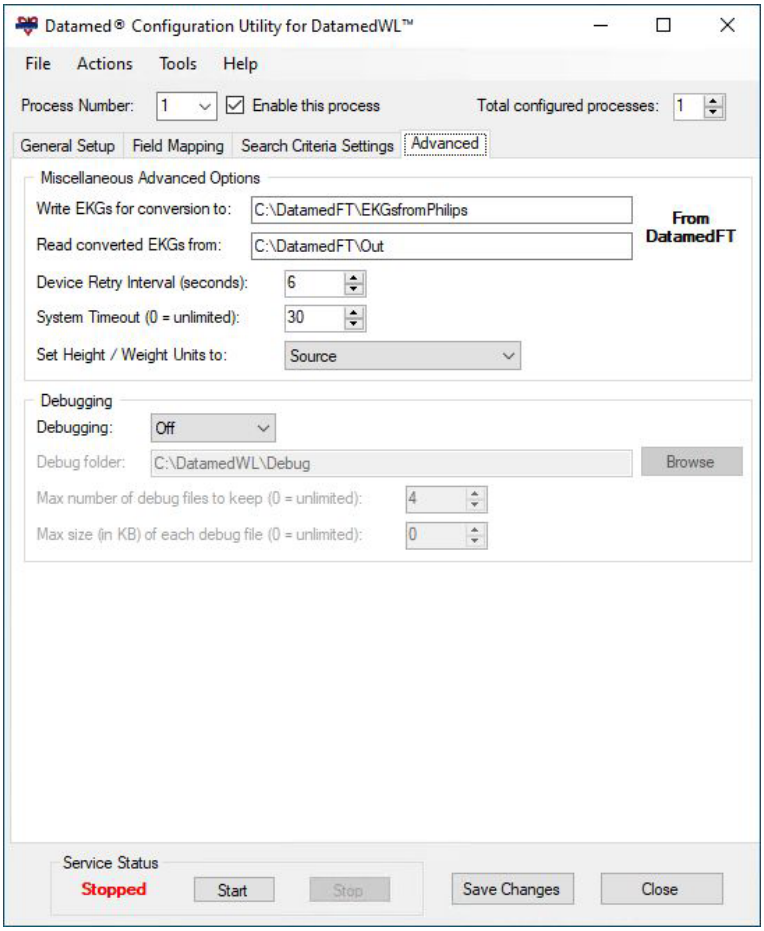
b. ***Filter Type*** is a selection list that has the following choices:
   i. ***Both*** – This selection means that the value coming from the DEVICE will be passed to the SYSTEM (if possible) and it will also be used internally to filter the data in the Order Response.
   ii. ***Internal*** – This selection means that the value coming from the DEVICE will be used internally to filter the data in the Order Response.
   iii. ***Multiple*** – This selection means that the value coming from the DEVICE will be used internally to filter the data in the Order Response, but first it will be split into multiple choices using the character(s) in the *Delimiter(s)* column. For example, if the incoming value is "ER,ICU" and the *Delimiter(s)* setting is a comma (the default), any Order that contains either "ER" or "ICU" in that field will be allowed through and all others will be discarded. *Multiple* can now be used with REGMAP lookups but the restriction is that both the Source field and the Destination field must be set to *Multiple* and the *Delimiter(s)* for both fields must be the same. See the example in *Chapter 4*.
   iv. ***External*** – This selection means that the value coming from the DEVICE will be passed to the SYSTEM (if possible).
   v. ***Pattern*** – As with ***Internal***, this selection means that the pattern value coming from the DEVICE will be used internally to filter the data in the Order Response. The difference is this will force DWL to use Regular Expression pattern matching which allows wildcards and arbitrarily complex patterns. ***The pattern will match any substring in the value***. This means that a pattern of "123" will match "12345" or "ABC123DEF". Regular Expression syntax can be quite complex so involving DLLC support personnel is a good idea when using this. If the DEVICE doesn't support text entry then a field mapping entry can be used to fill in the pattern.
   vi. ***Ignore*** – This selection means that the value coming from the DEVICE will be discarded. This is the default because it is the most permissive.

c. ***Delimiter(s)*** – This column is editable and will contain the character(s) used to split an incoming value into multiple choices. It is only used when ***Filter Type*** is set to *Multiple*. The default is a comma.

- ***Restore to the default settings***. If this button is pressed, all of the list entries will be reset to the default settings, which is ***Filter Type*** set to ***Ignore*** and ***Delimiter(s)*** all commas.

Tab: Advanced

This tab contains the advanced settings for the selected *Process Number*. These settings are for advanced users and will normally only be used with directions from DLLC support personnel. Each setting is described below.



Miscellaneous Advanced Options:

- ***Write EKGs for conversion to***. When installed with DFT, this is a read-only field that will be filled in with DFT's *Input Folder* and there will be text to the right that says "**From DatamedFT**". In the rare case where DFT is not installed, this field can be edited and it must be filled in with a folder where the incoming EKGs will be written to.
- ***Read converted EKGs from***. When installed with DFT, this is a read-only field that will be filled in with DFT's *Output Folder*.

- ***Device Retry Interval (seconds)***. For devices where DWL initiates and maintains the connection (currently only GE®), this is the number of seconds that DWL will wait to reconnect to the DEVICE after a disconnect.
- ***System Timeout (0 = unlimited)***. This is amount of time (in seconds) that DWL will wait for the SYSTEM to return the order response. If it is not done within this time frame a failure will be returned to the cardiograph and the intermediate file will be removed. Unlimited here means 30 minutes.
- ***Set Height / Weight Units to***. This controls the handling of units for Height and Weight. Some SYSTEMS always return Imperial or Metric values regardless of the local norm, while others always return both. If this setting is "Source" then the units returned from the SYSTEM are preserved, with Imperial selected when both are present. If either "Imperial" or "Metric" is selected then the values are converted to those units (if needed) when returning the order list to the DEVICE. The possible settings are "Source", "Imperial" (in/lbs) or "Metric" (cm/kg).

Debugging:

- ***Debugging***. In the event that there is a problem with the translator, DLLC support personnel may want to collect detailed technical information by turning on debugging. The choices for this are "Off" (default), "On", and "High". This setting should not be changed without consulting DLLC support personnel. When debugging is on a file (or files) containing debugging information will be written to the *Debug Folder*. This information is encrypted and should be sent to DLLC support for analysis. See *Chapter 7* for more details. ***Note that the debugging can be turned on without restarting the service - after saving the settings it will take effect with the next order query or incoming EKG***. ***Debugging will consume disk space and slow down the processing - it should not be left on unless DLLC is tracking down an issue***.
- ***Debug folder***. The folder where the debug files will be created. The ***Browse*** button allows you to browse for the folder to use (or create one). If no valid folder is specified then debugging will be disabled.
- ***Max number of debug files to keep (0 = unlimited)***. This is used to control the amount of disk space used for debug files. Each time the DatamedWL service is started or when the maximum size is reached (see below) a new debug file is created. As each new file is created, a check is made to make sure the total number of files does not exceed this value. If it does, the oldest file is aged out (deleted). The default setting is to keep the last four (4) files. As indicated by the label, setting this to zero (0) will disable the checking.
- ***Max size (in KB) of each debug file (0 = unlimited)***. This is also used to control the amount of disk space used for debug files. As entries are written to the current debug file, the size is checked to make sure it does not exceed the maximum. If it does, the file is closed and new file is created. The file size is specified in kilobytes (1,024 bytes) and the default setting is 0 (unlimited size).

Advanced DICOM Options: This group is disabled unless *System Type* is ***Cerner - PowerChart ECG***, ***DICOM (generic)***, ***Epiphany Cardio Server***, ***Esaote Suitestensa***, ***INFINITT Cardiology PACS***, ***Lumedx HealthView ECG Manager***, ***Change Healthcare Cardiology***, ***Medimatic - ComPACS***, or ***ScImage PicomEnterprise***.

- ***Max PDU Size***. This defines the maximum size of the Protocol Data Units. The default is 2048 and should not be changed.
- ***Transfer Syntax***. This is used to specify what Transfer Syntax will be used in the output: "Explicit VR Little Endian" (default) or "Implicit VR Little Endian".
- ***Use TLS***. If enabled, Transport Layer Security is used in the network communications.
- ***Use URL Suffix as AE Title***. If enabled, this will allow the DEVICE to send in an AE Title on the inbound URL. Currently it is only needed when *Device Type* is ***Philips - PageWriter Touch/TC*** and *System Type* is ***Change Healthcare Cardiology***. This is equivalent to setting the *Local AE Title* for both *Order Query* and *EKG Send* to ***[URLPath]***.
- ***Use MPPS - Port***. If enabled, this will cause DWL to include Modality Performed Procedure Step messages in the storage process. Since MPPS is not useful for a 10-second exam nor is it supported by the source devices, the MPPS steps are sent immediately following one another, which simulate the MPPS sequence. These steps are sent in order: NCREATE, CSTORE, NACTION, and then NSET to complete the sequence. When MPPS is used, enter the port that DWL will listen for the NSET message from the system.

CHAPTER 4 – FIELD MAPPING

The DWL Configuration utility provides for field mapping to control the data as it is processed. Fields can be set to specific values or to values from other fields. Certain fields (like the date range) have special capabilities. Field mapping should always be used with caution.

To use the field mapping, open the DWL Configuration utility, select the process (number) that needs to be configured, and select the Field Mapping tab. There are two text entry sections: one for the Order Query and one for the Order Responses. These sections allow for multiple field mapping entries.

The field mapping entries consist of a series of single-line entries with the form ***Destination=Source***. The order is important and the mapping is done sequentially. This allows for complex data manipulation, especially in conjunction with the TMPSTR and TMPINT temporary fields. The terms ***Destination*** and ***Source*** are relative to the direction of the data flow. For an Order Query (initiated by a request from the DEVICE), ***Source*** represents the data coming from the DEVICE and ***Destination*** represents the data going to the SYSTEM. For an Order Response (returned by the SYSTEM), ***Source*** represents the data coming back from the SYSTEM and ***Destination*** represents the data going back to the DEVICE. Note that date fields must be MMDDYYYY and time fields must be HHMMSS.

Field Mapping Syntax

The format of the source and destination for field mapping is different. The following describes the format of the ***Destination*** (left side of the '=' sign) data:

FieldName
This is one of the Internal Field Names from the table below.

TMPINT1 – TMPINT9
These are temporary holding locations for integer values. All values assigned to these placeholders are converted to integers.

TMPSTR1 – TMPSTR9
These are temporary holding locations for text values.

?
This character is used as a prefix to the *FieldName*. If present, it will only perform the mapping if the ***destination field*** is empty (blank).

!
This character is used as a prefix to the *FieldName*. If present, it will only perform the mapping if the ***source data*** is NOT empty (blank).

The following describes the format of the ***Source*** (right side of the '=' sign) data:

FieldName

This is one of the Internal Field Names from the table below.

FieldName{StartPos,Length}

StartPos is the starting character position - positive starts from the left and negative starts from the right (1 is 1st character, -1 is the last character).

Length is required (0 = to the end of the string, otherwise 1-n)

FieldName{Format,Length}

FieldName must be one of the integer placeholders (TMP1 – TMPINT9)

Format is one of the following:

FRZ = Fixed length (value will be padded or truncated), Right-justified, and padded with zeros

FLS = Fixed length (value will be padded or truncated), Left-justified, and padded with spaces

Length is required (1-20) - NOTE: any truncation will occur in the left-most digits (e.g. 12345 -> 345) INCLUDING any minus sign.

FieldName{REGMAP,RegistryKey} ***DEPRECATED***

RegistryKey is a full path to a registry key. By default the HKEY_LOCAL_MACHINE hive is used and the hive name is not required (see the examples below), however if desired the hive name can be entered. The following hives are supported: HKEY_LOCAL_MACHINE, HKEY_CURRENT_USER, HKEY_USERS, and HKEY_CURRENT_ CONFIG. Values must be either REG_SZ or REG_DWORD.

FieldName{FILEMAP,FileName,SourceCol,DestCol}

FileName is the full filename (including path) of a file that contains rows of data in CSV (comma separated value) format. There must be a minimum of 2 columns in the file.

SourceCol is the column number (starting at 1) that contains the value to be matched with the value in FieldName. The first row with a matching value will always be chosen, even if subsequent rows also match.

DestCol is the column number (starting at 1) that contains the value which is returned as the result of the mapping lookup.

NOTE: If the file is updated DWL must be restarted to update the cached data.

TMPINT1 – TMPINT9

These are temporary holding locations for integer values - they must have been used as a destination field first or they will be "0".

TMPSTR1 – TMPSTR9

These are temporary holding locations for values - they must have been used as a destination field first or they will be blank (256 chars).

"FixedText"

Text in double quotes will be used as written.

"NOW[+/-]##[D/H]"

This is a special option that can only be used in the Order Query field mapping with *SearchStartDatetime* and *SearchEndDatetime*. It produces a date/time value relative to the query execution time, offset plus or minus a specified number of days or hours. Examples: **"NOW-1D"**, **"NOW+2D"**, or **"NOW+6H"**. When using the "D" designator, the time value will always be set to midnight (00:00:00), but when using the "H" designator it will use the current time. So if the current date/time is January 4th at 1pm, -1D would be January 3rd at midnight (37 hours backward), +1D would be January 5th at midnight (11 hours forward), and +6H would be January 4th at 7pm.

+

Concatenate fields. The fields can be any of the other formats listed above except for "NOW".

Examples

The following examples demonstrate the syntax:

- To hardcode the Device ID as "1":
  DeviceID="1"
- To copy the MMDD portion of the Order Request Date to Department Name:
  DepartmentName=OrderRequestDate{6,0}
- To copy Current Location to Bed Number:
  BedNumber=PatientLocation
- To copy Department Name to Department ID only if Department ID is empty:
  ?DepartmentID=DepartmentName
- It is often useful to use a single mapping file to map multiple output values from one input value. This example can be used to map the Inbox value from a Philips® TCxx cart to Location and Site for GE® MUSE®. To use a file with mapping entries to map the Department Name coming from the DEVICE to a Department ID and Institution ID:

  First write down the mapping data. Here is sample data:

DepartmentName from DEVICE	DepartmentID for SYSTEM	InstitutionID for SYSTEM
ER-W	10	1
ICU-W	11	1
CCU-W	12	1
ER-E	15	2

Now create a text file and put this data in the file (sample.csv):

```
DepartmentName,DepartmentID,InstitutionID
ER-W,10,1
ICU-W,11,1
CCU-W,12,1
ER-E,15,2
```

Lastly, add these Order Query Field Mapping entries:

```
DepartmentID=DepartmentName{FILEMAP, C:\Temp\LocationSiteMap.csv,1,2}
InstitutionID=DepartmentName{FILEMAP, C:\Temp\LocationSiteMap.csv,1,3}
```

Field List

Order Query Fields

This is the complete list of possible fields contained in the order query message which originates in the DEVICE and is sent to the SYSTEM. The field mapping is done after the DEVICE data is converted to the internal fields. Each format supports only a subset of the fields. In the table below, the data type and maximum size or allowed values are listed for each field.

Internal Field	Data Type / Values
Authentication Fields (not searchable)	
Domain	String (Max 64 characters)
UserName	String (Max 64 characters)
Password	String (Max 64 characters)
Version	String (Max 64 characters)
Search Control Fields	
MaxRecords	Integer – default 100
SearchStartDatetime	String – YYYY-MM-DD HH:MM:SS
SearchEndDatetime	String – YYYY-MM-DD HH:MM:SS
Order Information Search Fields	
AccountNumber	String (Max 64 characters)
AttendingPhysicianName	String (Max 32 characters)
DepartmentID	String (Max 64 characters)
DepartmentName	String (Max 64 characters)
DeviceID	String (Max 64 characters)
EncounterNumber	String (Max 64 characters)
FacilityID	String (Max 64 characters)
FacilityName	String (Max 64 characters)
InstitutionID	String (Max 64 characters)
InstitutionName	String (Max 64 characters)
Modality	String (Max 64 characters) – default “ECG”
OrderNumber	String (Max 64 characters)
PatientLocation	String (Max 64 characters)
Priority	String (Max 64 characters)
RoomNumber	String (Max 64 characters)
Patient Information Search Fields	
PatientID	String (Max 64 characters)

SecondaryPatientID	String (Max 64 characters)
PatientFName	String (Max 64 characters)
PatientMName	String (Max 64 characters)
PatientLName	String (Max 64 characters)
BirthDate	String – YYYY-MM-DD

Order Response Fields

This is the complete list of possible fields contained in the order response message which originates in the SYSTEM and is returned to the DEVICE. ***Because the Order Response normally consists of multiple orders, it is very important to remember that the field mapping will be done to each instance of the order list, so only fill in values that should go in each list record***. The field mapping is done after the SYSTEM data is converted to the internal fields. Each format supports only a subset of the fields. In the table below, the data type and maximum size or allowed values are listed for each field.

Internal Field	Data Type / Values
Order Information Fields	
AccountNumber	String (Max 64 characters)
AttendingPhysicianName	String (Max 64 characters)
BedNumber	String (Max 64 characters)
DeviceID	String (Max 64 characters)
DepartmentID	String (Max 64 characters)
DepartmentName	String (Max 64 characters)
EncounterNumber	String (Max 64 characters) – This field is also called Admission ID or Visit Number
FacilityID	String (Max 64 characters)
FacilityName	String (Max 64 characters)
InstitutionID	String (Max 64 characters)
InstitutionName	String (Max 64 characters)
LocationID	String (Max 64 characters)
MessageID	String (Max 64 characters)
Modality	String (Max 64 characters)
OrderBillingCode	String (Max 64 characters)
OrderNumber	String (Max 64 characters)
OrderReason	String (Max 64 characters)
OrderRequestDate	String YYYY-MM-DD
OrderRequestTime	String HH:MM:SS
OrderStatus	String (Max 64 characters)

PatientLocation	String (Max 64 characters)
PerformingPhysicianID	String (Max 64 characters)
PerformingPhysicianName	String (Max 64 characters)
Priority	String (Max 64 characters)
RecordUniqueID	String (Max 64 characters) – In DFT this field is named EKGUniqueID
ReferringPhysicianID	String (Max 64 characters)
ReferringPhysicianName	String (Max 64 characters)
RequestingPhysicianID	String (Max 64 characters)
RequestingPhysicianName	String (Max 64 characters)
RoomNumber	String (Max 64 characters)
TechnicianID	String (Max 64 characters)
TechnicianName	String (Max 64 characters)
UnitNumber	String (Max 64 characters)
User1 - User8	String (Max 64 characters) – 8 fields
Patient Information Fields	
PatientID	String (Max 64 characters)
SecondaryPatientID	String (Max 64 characters)
PatientFName	String (Max 64 characters)
PatientMName	String (Max 64 characters)
PatientLName	String (Max 64 characters)
Age	Integer
AgeUnits	Values: 'Hours', 'Days', 'Weeks', 'Months', 'Years'
BirthDate	String YYYY-MM-DD
BirthTime	String HH:MM:SS
Gender	Values: 'Female', 'Male', 'Unknown'
Race	Values: 'Unknown', 'Eskimo', 'American Indian', 'Black', 'Hawaiian', 'Hispanic', 'Oriental', 'Pacific Islander', 'Caucasian', 'Other Race'
ImperialMetricUnits	Values: 'Imperial', 'Metric', '<blank>'
HeightIN	Integer
HeightCM	Integer
WeightLB	Integer
WeightKG	Integer

CHAPTER 5 – DEVICE TYPES

The DWL application will accept order queries and EKGs sent from a number of cardiographs. All of these devices transmit via LAN, but the exact method differs. The following sections describe each supported device and detail any special installation/configuration requirements. ***The information presented is for use in configuration of DWL and does not imply endorsement of the referenced vendor.***

Baxter / Hillrom (Mortara®, Welch Allyn®)

Mortara® ELI®-series cardiographs

Welch Allyn® CP150 with DICOM option

Welch Allyn® Diagnostic Cardiology Suite (DCS) (formerly Connex Cardio)

These cardiographs communicate using a TCP/IP connection directly to a utility named ELI® Link. This must be obtained from Mortara and the cardiograph must have the DICOM® option. ELI® Link will be configured to communicate using a TCP/IP connection directly to DWL for the order query, and to write EKG files to a local folder. All of 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 Mortara representative for the approved instructions. ***IMPORTANT NOTE: When planning the server configuration be sure to check with Baxter about what OS versions are supported. As of the time of this printing Server 2019 was the highest version OS supported.***

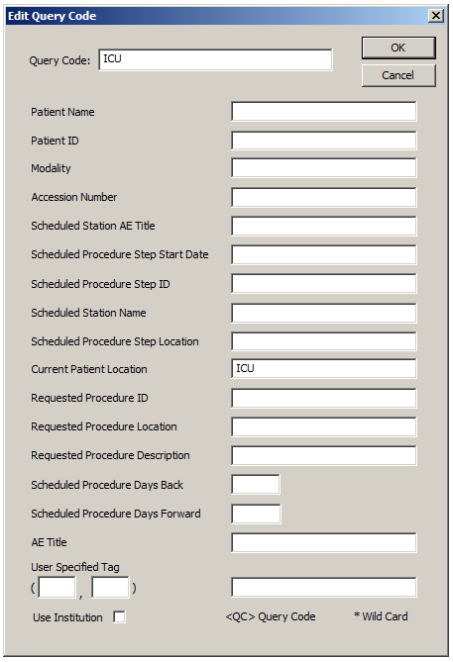
There are two EKG format options available when using the Mortara cardiographs: DICOM® or XML. We recommend using the DICOM® format because there are several fields that are only included in this format and not in the XML format. Details are below in the Supported Fields list. **Order Number is only supplied when using the DICOM® output.**

For the Mortara carts, the search criteria are configured in ELI® Link on the Query Code screens. Since the query is set up centrally and you can set up multiple saved queries, the carts are able to pick from the available queries when retrieving a worklist. See the ELI® Link manual for more details on setting up the Query Codes (saved queries).

The most common search criterion is the DepartmentName field. Although this field is not shown on the Query Code screens, you can use the edit field for *Current Patient Location* on this screen as the Department Name for the query and then add this Order Request Field Mapping entry:

DepartmentName=PatientLocation

This is an example of what the Query Code screen would look like with this setting:



These instructions are for an ELI® 150 with an older version of ELI® Link and the exact steps can vary by model – always consult the device user manual. To configure the cart for use with DWL:

1. Install ELI® Link on the Computer. If the DICOM® configuration component is not enabled, contact Mortara. NOTE: Support for Server 2016 and Server 2019 was added in ELI® Link version v5.1.2.
2. Run the ELI® Link configuration utility and set up the following:
    a. On the *General* tab, select only *Enable Network Comm* and set the *Port* to 5101.
    b. Still on the *General* tab, press the *DICOM Configuration* button. On the pop-up screen, the MWL group settings have to be filled in:
        i. Remote Host Name: localhost
        ii. Local AE: MORTARA
        iii. Remote Port Number: 104 (This must match the *Port* setting in DWL)
        iv. Remote AE: DatamedWL (This must match the *C-Find AE Title* setting in DWL)
    c. On the *Export Folders* tab, click on *Edit Set* if there is an entry present or *Add Set* if not. On the pop-up screen, locate the line labeled *XML-MI* and press the *Browse* button, then navigate to the folder specified as *EKG Input Folder* in DWL.
    d. Set up the *Query Codes* tab entries as desired per the ELI® Link manual.

3. Make sure the cart is plugged into the LAN and turn it on. Then do the following:
    a. Hit ***F6*** (More), then ***3*** (Set Date/Time), then ***UpArrow+Alt+C*** together. The cart should ask for a password. Contact Mortara or DLLC for the password.
    b. Press ***Page*** until you get to page 6. Either turn on DHCP or set up the Cart IP Address, Gateway, and Subnet Mask. Enter the Host IP Address (Computer's address), and Port # (5101).
    c. Press ***F6*** (Exit) to save the settings.
    d. Refresh the cart settings from ELI® Link by pressing ***F6*** (More), then ***7*** (Custom ID download). Make sure you see the message "Connected", and then "Custom ID downloaded".

To retrieve the list of orders:

1. On the cart, press ***F6*** (More) and then ***6*** (Modality Worklist). The screen should allow you to select the desired Query Code and then press ***F2*** (Yes) to confirm the order request. Press ***STOP*** to return to the previous screen.

To record an exam from the worklist and send it:

1. Press ***F1*** (ID), then ***F4*** (MWL) and select the desired order. Press ***AUTO12*** to record the EKG.
2. Press ***XMT*** to transmit the EKG.

Supported Fields

These are the DWL fields supported by this Device Type. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data returned to the DEVICE will typically be a subset of the Order Response list. Also recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field. For the Order Request, the fields with DICOM tags below would need to be entered as a *User Specified Tag*, while the others are named fields on the screen.

- **Order Request**
    - *Order Information Search Fields*
        - AttendingPhysicianName *(0032,1032) Requesting Physician*
        - DepartmentName *(0008,1040) Institutional Department Name*
        - DeviceID *(0018,1003) Station Name*
        - EncounterNumber *(0038,0010) Admission ID*
        - InstitutionName *(0008,0080) Institution Name*
        - Modality *(0008,0060) Modality*
        - OrderNumber *(0008,0050) Accession Number*
        - PatientLocation *(0038,0300) Current Patient Location*
        - Priority *(2200,0020) Request Priority*
        - RoomNumber *(0038,0400) Patient's Institutional Residence*
    - *Patient Information Search Fields*
        - PatientID *(0010,0020) Patient ID*

- SecondaryPatientID *(0010,1000) Other Patient IDs*
- PatientFName *(0010,0010) Patient's Name*
- PatientMName *(0010,0010) Patient's Name*
- PatientLName *(0010,0010) Patient's Name*
- BirthDate *(0010,0030) Patient's Birth Date*

- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - DeviceID *(0018,1003) Station Name*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - OrderReason *(0008,1030) Study Description*
    - OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
    - OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
    - PatientLocation *(0038,0300) Current Patient Location*
    - PerformingPhysicianName *(0008,1050) Performing Physician's Name*
    - Priority *(0040,1003) Requested Procedure Priority*
    - RecordUniqueID *(0020,000D) Study Instance UID*
    - ReferringPhysicianName *(0008,0090) Referring Physician's Name*
    - RequestingPhysicianName *(0032,1032) Requesting Physician*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
    - TechnicianName *(0008,1070) Operator's Name*
  - *Patient Information Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - Age *(0010,1010) Patient's Age*
    - BirthDate *(0010,0030) Patient's Birth Date*
    - BirthTime *(0010,0032) Patient's Birth Time*
    - Gender *(0010,0040) Patient's Sex*
    - Race *(0010,2160) Ethnic Group*
    - HeightCM *(0010,1020) Patient's Size*
    - WeightKG *(0010,1030) Patient's Weight*

Burdick® Atria 3100/6100 and 8300/8500 cardiographs

These cardiographs communicate using a TCP/IP connection directly to DWL. All of 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 Mortara representative for the approved instructions.

To configure the cart for use with DWL:

1. Press *Setup* and then choose *Network Connection*. Enter the network values assigned to this cart.
2. Press *Back* and then choose *Printer and ECG destinations*.
3. Choose *Add a new destination*.
4. For *Destination type* select ***Pyramis/Heartcentrix***.
5. For *Destination name* enter ***Heartcentrix***.
6. For *URL/IP* enter the URL you configured as the *Listener URL* in the DWL configuration.
7. For *Institution number* enter the fixed value you want in this search field.

To retrieve the list of orders:

1. Press *Send/Receive* and the choose *Get patient orders*.
2. Enter the query criteria as desired and then press *Send/Receive* to run the query.
3. Select an order from the list and press *Send/Receive* again to load this to the open orders directory.

To record an exam from the worklist and send it:

1. In the directory, choose *View list of open orders*.
2. Select the order and then choose *Acquire new ECG*.
3. Record the ECG and then on the pop-up screen choose *Send ECG to EMR*.

Supported Fields

These are the DWL fields supported by this Device Type. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data returned to the DEVICE will typically be a subset of the Order Response list. Also recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field.

- **Order Request**
  - *Order Information Search Fields*
    - DepartmentName
    - InstitutionID
    - OrderNumber
  - *Patient Information Search Fields*
    - PatientID
    - PatientFName
    - PatientLName
- **Order Response (shown on the cart and/or in the recorded EKG)**
  - *Order Information Fields*
    - AccountNumber

- AttendingPhysicianName
- DepartmentName
- InstitutionID
- OrderNumber
- OrderReason
- OrderRequestDate
- OrderRequestTime
- OrderStatus
- Priority
- ReferringPhysicianID
- ReferringPhysicianName
- RequestingPhysicianID
- RequestingPhysicianName
- RoomNumber

- *Patient Information Fields*
  - PatientID
  - PatientFName
  - PatientLName
  - BirthDate
  - BirthTime
  - Gender
  - Race

Eclipse™ Premier cardiographs

These cardiographs communicate using a TCP/IP connection directly to DWL. All of 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 Mortara representative for the approved instructions.

To configure the cart for use with DWL:

1. Configure the Wireless Client Bridge (WCB) to point to the *Listener IP* and *Port* that is configured in DWL. This is the most difficult part of the configuration and is usually done by connecting the WCB to a standalone computer.

To retrieve the list of orders:

1. From the Main Menu, select *Directory* and then *Get Requisitions*.
2. Enter the query criteria as desired and then run the query. The keyboard shortcut for this 2-step sequence is: M D Q Q.
3. Select an order from the list and press *OK* to select this order.

To record an exam from the worklist and send it:

1. Choose *Acquire EKG* to get to the editing screen, then press the blue button to record the ECG.

2. From the main menu press *Send* to transmit.

IMPORTANT NOTE: These devices can retrieve an order list and use that information when recording an EKG; however they do not supply the Order Number in the EKG that is sent so it may not be possible to automatically tie out the order as completed depending on the SYSTEM capabilities. This is a very important consideration when setting up the order workflow.

Supported Fields

These are the DWL fields supported by this Device Type. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data returned to the DEVICE will typically be a subset of the Order Response list. Also recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field.

- **Order Request**
  - *Order Information Search Fields*
    - DepartmentID
    - InstitutionID
    - OrderNumber
- **Order Response (shown on the cart and/or in the recorded EKG)**
  - *Order Information Fields*
    - DepartmentID
    - DepartmentName
    - DeviceID
    - EncounterNumber
    - OrderNumber
    - OrderReason
    - OrderRequestDate
    - OrderRequestTime
    - OrderStatus
    - RoomNumber
  - *Patient Information Fields*
    - PatientID
    - PatientFName
    - PatientLName
    - Age
    - AgeUnits
    - BirthDate
    - Gender
    - Race
    - HeightIN
    - HeightCM

- WeightLB
- WeightKG

DICOM®

For a device that supports DICOM® Modality Worklist functionality, configure the C-STORE and C-FIND functionality to match the settings configured in DWL. The Remote or System AE Title in the device must match the ones in DWL.

The most common search criterion is the DepartmentName field, which comes from DICOM tag (0008,1040) Institutional Department Name. If a cart is always in one department then it should be configured in the cart settings. If the cart can move between departments then it should be changed as needed before querying for a worklist. If ***all*** carts of this type are in a single department, field mapping can be used to hardcode the department setting.

Some devices may use (0038,0300) Current Patient Location to represent the department. If that is the case, you can use this Order Request Field Mapping entry:

DepartmentName=PatientLocation

Supported Fields

These are the DWL fields supported for this Device Type. Be aware that each manufacturer may support more or fewer fields than this list. Consult the device's DICOM Conformance Statement to confirm what it does and does not support. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data returned to the DEVICE will typically be a subset of the Order Response list. Also recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*

        - PatientMName *(0010,0010) Patient's Name*
        - PatientLName *(0010,0010) Patient's Name*
        - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
    - *Order Information Fields*
        - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
        - DeviceID *(0018,1003) Station Name*
        - DepartmentName *(0008,1040) Institutional Department Name*
        - EncounterNumber *(0038,0010) Admission ID*
        - InstitutionName *(0008,0080) Institution Name*
        - Modality *(0008,0060) Modality*
        - OrderNumber *(0008,0050) Accession Number*
        - OrderReason *(0008,1030) Study Description*
        - OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
        - OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
        - PatientLocation *(0038,0300) Current Patient Location*
        - PerformingPhysicianName *(0008,1050) Performing Physician's Name*
        - Priority *(0040,1003) Requested Procedure Priority*
        - RecordUniqueID *(0020,000D) Study Instance UID*
        - ReferringPhysicianName *(0008,0090) Referring Physician's Name*
        - RequestingPhysicianName *(0032,1032) Requesting Physician*
        - RoomNumber *(0038,0400) Patient's Institutional Residence*
        - TechnicianName *(0008,1070) Operator's Name*
    - *Patient Information Fields*
        - PatientID *(0010,0020) Patient ID*
        - SecondaryPatientID *(0010,1000) Other Patient IDs*
        - PatientFName *(0010,0010) Patient's Name*
        - PatientMName *(0010,0010) Patient's Name*
        - PatientLName *(0010,0010) Patient's Name*
        - Age *(0010,1010) Patient's Age*
        - BirthDate *(0010,0030) Patient's Birth Date*
        - BirthTime *(0010,0032) Patient's Birth Time*
        - Gender *(0010,0040) Patient's Sex*
        - Race *(0010,2160) Ethnic Group*
        - HeightCM *(0010,1020) Patient's Size*
        - WeightKG *(0010,1030) Patient's Weight*

Edan Instruments, Inc.

SE-12 Express, SE-1200 Express, SE-1201, SE-1202, SE-15, SE-1515, SE-16, SE-18, and SL-18 cardiographs

These cardiographs use a TCP/IP connection directly to DWL for the order query, and an FTP connection to send the EKG. The FTP Server built into Windows Server with IIS can be used; however, if Philips carts are also in use then IIS Web Services must be disabled. We have tested the open source program FileZilla and it works very well for this purpose, but any other FTP server should also work. All of 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 Edan representative for the approved instructions.

The most common search criterion is the DepartmentName field. If a cart is always in one department then it should be configured in the cart settings. If the cart can move between departments then it should be changed as needed before querying for a worklist. If ***all*** carts of this type are in a single department, field mapping can be used to hardcode the department setting.

Set up the desired FTP server, then add a user and set the home path to match the *EKG Input Folder* configured in DWL, and then set the permissions to full control (read/write/delete). The user and password will be used below.

IMPORTANT NOTE: The Edan cart has a very short timeout that is not configurable in the current firmware. Some systems are not quick enough or take longer for the first query because of caching. In these cases the cart may timeout, especially on the first query. Normally querying a second time will get the data back. If the system is returning a large number of orders it may not be possible to get the list back at all.

To configure the cart for use with DWL:

1. From the main screen, press the ***Set Up*** button to go to the overall settings for this cart.
2. Touch ***Transmission*** and then **Transmission Mode** for ***Ethernet***. Select DHCP or set up a static IP address, subnet mask, and gateway for the cart.
3. Enter the IP address of the Computer as *Server IP*.
4. Enter the name and password that the user account in the FTP server was set up with.
5. Select *Auto Transmission* and set it to *On*.
6. Leave the *FTP Path* blank.

To retrieve the list of orders:

1. Touch the arrow button, then ***Order***, then ***Load*** to query for orders.

To record an exam from the worklist and send it:

1. From the order list, select the desired entry, touch **Examine,** then **Record**. If *Auto Transmission* was set to "On" then that EKG will be sent to the Computer automatically.
2. If *Auto Transmission* was set to "Off":
    a. Press the ***Esc*** button to back out, then the arrow button, and then ***File*** to see the EKG.
    b. Press ***Select*** on that EKG and then press ***Trans*** to transmit the EKG.

IMPORTANT NOTE: These devices can retrieve an order list and use that information when recording an EKG; however they do not supply the Order Number in the EKG that is sent so it may not be possible to automatically tie out the order as completed depending on the SYSTEM capabilities. This is a very important consideration when setting up the order workflow.

Supported Fields

These are the DWL fields supported by this Device Type. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data returned to the DEVICE will typically be a subset of the Order Response list. Also recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field.

- **Order Request**
    - *Order Information Search Fields*
        - AttendingPhysicianName *Performing Physician*
        - DepartmentName
        - DeviceID
        - Modality
    - *Patient Information Search Fields*
        - PatientID
        - PatientLName
- **Order Response (shown on the cart and/or in the recorded EKG)**
    - *Order Information Fields*
        - DeviceID
        - DepartmentName
        - OrderNumber
        - OrderRequestDate
        - PerformingPhysicianName
    - *Patient Information Fields*
        - PatientID
        - PatientFName
        - PatientMName
        - PatientLName

- Age
- AgeUnits
- BirthDate
- Gender

Fukuda Denshi

FX-8400 cardiographs

This device supports DICOM® Modality Worklist functionality and can transmit ECGs as DICOM ECG Waveform objects. You must configure the C-STORE and C-FIND functionality to match the settings configured in DWL. The Remote or System AE Title in the device must match the ones in DWL.

Supported Fields

These are the DWL fields supported by this Device Type. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data returned to the DEVICE will typically be a subset of the Order Response list. Also recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*

- DeviceID *(0018,1003) Station Name*
- DepartmentName *(0008,1040) Institutional Department Name*
- EncounterNumber *(0038,0010) Admission ID*
- InstitutionName *(0008,0080) Institution Name*
- Modality *(0008,0060) Modality*
- OrderNumber *(0008,0050) Accession Number*
- OrderReason *(0008,1030) Study Description*
- OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
- OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
- PatientLocation *(0038,0300) Current Patient Location*
- PerformingPhysicianName *(0008,1050) Performing Physician's Name*
- Priority *(0040,1003) Requested Procedure Priority*
- RecordUniqueID *(0020,000D) Study Instance UID*
- ReferringPhysicianName *(0008,0090) Referring Physician's Name*
- RequestingPhysicianName *(0032,1032) Requesting Physician*
- RoomNumber *(0038,0400) Patient's Institutional Residence*
- TechnicianName *(0008,1070) Operator's Name*

- *Patient Information Fields*
  - PatientID *(0010,0020) Patient ID*
  - SecondaryPatientID *(0010,1000) Other Patient IDs*
  - PatientFName *(0010,0010) Patient's Name*
  - PatientMName *(0010,0010) Patient's Name*
  - PatientLName *(0010,0010) Patient's Name*
  - Age *(0010,1010) Patient's Age*
  - BirthDate *(0010,0030) Patient's Birth Date*
  - BirthTime *(0010,0032) Patient's Birth Time*
  - Gender *(0010,0040) Patient's Sex*
  - Race *(0010,2160) Ethnic Group*
  - HeightCM *(0010,1020) Patient's Size*
  - WeightKG *(0010,1030) Patient's Weight*

GE® Healthcare

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***.

Make sure you are running DWL v3.1.3 or later for these devices. For the VU360 we recommend that the cart have firmware v1.02 SP01 or higher.

To configure the cart for use with DWL:

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 *Communication (DCP) Listener URL* in the DWL Configuration. For example: http://192.168.121.86:2490. The Test Connection button can be used to confirm connectivity as long as DWL is running. Enable this as the Default and apply the settings.
4. In the *Order* submenu select MUSE Settings, then enter the URL that is configured as *Orders (WebAPI) Listener URL* in the DWL Configuration. The User Name and Password must be filled in but the values are not used at this time. The Test Connection button can be used to confirm connectivity as long as DWL is running.
5. Still in the *Order* submenu select Order Settings, then enable Allow Unprivileged User to Attach Orders and also Show Pending Orders. Location Filter can be set to always query orders from a specific Location, which is DepartmentID in DWL.

The default search range in DWL is +/- 3 days but the range that the MAC VU360 will display is currently hardcoded to -28 hours / +12 hours and it cannot be changed. We recommend setting the range in DWL to:

SearchStartDatetime="NOW-28H"
SearchEndDatetime="NOW+12H"

If order management is enabled on the cart them the order list will be on the acquisition screen. To query for orders open the Orders screen and refresh the list. To select an order touch the line on the screen. Once the order is retrieved then the ECG can be recorded.

Barcode scanning is compatible with certain limitations. The cart supports two options for the IDs: Patient ID and Visit Number. Patient ID barcodes are supported with all systems because Patient ID is part of the data coming from the system. When configuring the barcodes, make sure that the Patient ID length in the cart setup is at least as long as in the barcode setup. Using Visit ID is more complicated because the cart has to first query the system for the Patient ID using the Visit Number. This functionality currently only works with DICOM-based systems that support the patient query, which is very limited. Refer to the GE documentation and/or your GE support representative for details on how to configure the cart with the barcode reader.

Supported Fields

These are the DWL fields supported by this Device Type. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data

returned to the DEVICE will typically be a subset of the Order Response list. Also recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field.

- **Order Request**
  - *Order Information Search Fields*
    - DepartmentID *Location number*
    - EncounterNumber *Visit Number*
    - InstitutionID *Site number*
    - OrderNumber
  - *Patient Information Search Fields*
    - PatientID
- **Order Response (shown on the cart and/or in the recorded EKG)**
  - *Order Information Fields*
    - AccountNumber
    - BedNumber
    - DepartmentID
    - DepartmentName
    - EncounterNumber *Visit Number*
    - OrderNumber
    - ReferringPhysicianID
    - ReferringPhysicianName
    - RequestingPhysicianID
    - RequestingPhysicianName
    - RoomNumber
  - *Patient Information Fields*
    - PatientID
    - SecondaryPatientID
    - PatientFName
    - PatientLName
    - Age
    - AgeUnits
    - BirthDate
    - Gender
    - Race
    - HeightIN
    - HeightCM
    - WeightLB
    - WeightKG

MAC® 800, MAC® 2000, MAC® 3500, MAC® 5000, MAC® 5500, and MAC® 5500HD cardiographs

Depending on the cart model, there are one or two methods of connection, and there are two different transmission options:

- Using the built-in LAN port. Not all models contain this port but for those that do, it provides wired LAN capability with no additional equipment. For this type of connection choose ***GE® - MAC® (DWL connects to each cart)*** for the *Device Type*. These connections are initiated from the server so the IP address of each cardiograph (and a port) must be entered in the *Cart Addresses* list during configuration.
- Using the built-in serial port with a serial-to-LAN adapter (wireless bridge). This provides wireless (or wired) LAN capability. ***Note that the adapter must be plugged into port 2 – if it is plugged into port 1 then it will not work***. The Silex™ adapter can be configured to one of two different transmission options depending on the *eCable Mode* setting on the *I/O Port Settings* page:
    - With *eCable Mode* set to ***Enable***, the adapter will initiate the connection to DWL. For this type of connection choose ***GE® - MAC® (Carts connect to DWL listener)*** for the *Device Type*. During configuration the *IP address* and *Port* is specified and a listener is started for incoming connections from the carts.
    - With *eCable Mode* set to ***Disable***, the adapter will wait for a connection from DWL just like the cart does using the LAN port. For this type of connection choose ***GE® - MAC® (DWL connects to each cart)*** for the *Device Type*. These connections are initiated from the server so the IP address of each cardiograph (and a port) must be entered in the *Cart Addresses* list during configuration. **This is the same method that MUSE® uses and is the recommended option as long as the adapters can be assigned static IPs or fixed DHCP-assigned IPs.**

All of 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.

When starting a search in the *Order Mgr* screen, the cart will pop up a window to get the Location Number(s) (*DepartmentID*) to search for. Although the message indicates that multiple number or even a range can be entered, that functionality is not available for queries from non-GE systems. You must enter a single number or nothing into that field. Many systems do not support searching by *DepartmentID*, so you may need to set up an Order Request field mapping entry and REGMAP table to map the numbers to department names. The destination field would normally either be *DepartmentID* or *PatientLocation*. *Chapter 4* has an example of how to set up the REGMAP functionality for this purpose.

Another value used for searches is the Site number (*InstitutionID*). This value is entered in the *System Setup->Basic System->Miscellaneous Setup* screen. As with *DepartmentID*, *InstitutionID* may not be a searchable field, so you may need to set up a REGMAP table to map the numbers to names and put the name in *InstitutionName*.

These carts will only support Order Numbers up to 9 digits long. Many systems (e.g. Cerner PowerChart ECG) use longer Order Number values. If a longer Order Number comes back from the SYSTEM then DWL will automatically generate an alternate Order Number for the cart. This simulated number will be a 3 digit sequence number and the last 6 characters of the actual Order Number. This can be confusing if you check the Order Number on the cart. But when the ECG is sent, DFT will restore the original Order Number.

Barcode scanning is compatible with certain limitations. The cart supports two options for the IDs: Patient ID and Visit Number. Patient ID barcodes are supported with all systems because Patient ID is part of the data coming from the system. Firmware v10A.1 and higher will send the Patient ID in the query AND filter it internally; lower firmware will only filter internally. When configuring the barcodes, make sure that the Patient ID length in the cart setup is at least as long as in the barcode setup. Using Visit ID is more complicated because the cart has to first query the system for the Patient ID using the Visit Number. This functionality currently only works with DICOM-based systems that support the patient query, which is very limited. Refer to the GE documentation for details on how to configure the cart with the barcode reader.

In the instructions below, when entering *System Setup* you will need to enter the system password. If you don't have this please contact GE for assistance.

To configure the cart for use with DWL using the LAN port:

1. Go to the *System Setup* menu and choose *Basic System*, then *Transmission*.
2. Set *Type* to ***MUSE NETWORK***, and set *Default Location* to ***Ethernet (MUSE)***.
3. Back up to the *Basic System* menu and choose *Network Setup*.
4. Enter the *IP Address*, *Subnet Mask*, *Gateway*, and *Port Number* that is assigned to this cart.
5. For DWL, set *Device Type* to ***GE® - MAC® (DWL connects to each cart)***, then enter this *IP Address* and *Port Number* into the *Cart Addresses* list.

To configure the cart for use with DWL using a serial-to-LAN adapter (wireless bridge):

1. Make absolutely certain that the adapter is plugged into port 2 – this is critical.
2. Go to the *System Setup* menu and choose *Basic System*, then *Transmission*.
3. Set *Type* to ***MUSE NETWORK***, and set *Default Location* to ***Serial Line (MUSE)***.
4. Follow the instructions that came with the cart and wireless bridge to install and configure the adapter. ***Detailed configuration information including screenshots can be found in chapters 3 and 4 of the DRCV01 Service Manual***.
5. For DWL:
    a. When *eCable Mode* in the Silex adapter is set to ***Enable***, set *Device Type* to ***GE® - MAC® (Carts connect to DWL listener)***. The *Listener IP* and *Port* in DWL must match the *Destination IP Address* and *Destination Port* in the adapter settings.
    b. When *eCable Mode* in the Silex adapter is set to ***Disable***, set *Device Type* to ***GE® - MAC® (DWL connects to each cart)***. In DWL you will need to enter the *IP Address* and *Port Number* of the Silex adapter into the *Cart*

Addresses list. The IP address is on the *Configure TCP/IP* screen of the adapter configuration, and the port is accessed by selecting the **second** link in *Enabled Services*.

To retrieve the list of orders:

1. Select *Order Mgr Int*. This will load the Order Manager screen.
2. Select *Load Orders*.
3. The cart will ask for Location number(s). You can leave this blank for all orders or enter a value to search using *DepartmentID* as a search criteria (typically with REGMAP to a name).
4. When you press OK the cart will query for the list of orders from DWL and present a list. On this screen, select one or more orders and then press *Load Orders* to load the orders.
5. Alternatively, you can search for a specific patient by entering the Patient ID on the Find Patient screen. This is how the barcode functionality works.

To record an exam from the worklist and send it:

1. From the Order Manager screen, press *Select*, select an order from the list, and then press *Continue* to go to the ECG screen. Alternatively you can select *Patient Data* and then press *Return* to go to the ECG screen.
2. If the cart is configured to automatically transmit (*System Setup->ECG->ECG Analysis->Auto ECG Transmission*) then the ECG will be transmitted after completion. Otherwise you will need to manually transmit from the File Manager screen.

IMPORTANT NOTE: If DRCV01 is installed on the Computer to handle connections with GE® carts that don't support orders (e.g. MAC® 1200), take care to make sure that the listener port for DWL is not the same as for DRCV01.

Supported Fields

These are the DWL fields supported by this Device Type. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data returned to the DEVICE will typically be a subset of the Order Response list. Also recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field.

- **Order Request**
  - *Order Information Search Fields*
    - DepartmentID — *Location number*
    - InstitutionID — *Site number*
  - *Patient Information Search Fields*
    - PatientID

- **Order Response (shown on the cart and/or in the recorded EKG)**
  - *Order Information Fields*
    - AccountNumber
    - BedNumber
    - DepartmentID
    - DepartmentName
    - EncounterNumber *Visit Number*
    - OrderNumber
    - ReferringPhysicianID
    - ReferringPhysicianName
    - RequestingPhysicianID
    - RequestingPhysicianName
    - RoomNumber
  - *Patient Information Fields*
    - PatientID
    - SecondaryPatientID
    - PatientFName
    - PatientLName
    - Age
    - AgeUnits
    - BirthDate
    - Gender
    - Race
    - HeightIN
    - HeightCM
    - WeightLB
    - WeightKG

Nihon Kohden® Corporation

Cardiofax® S (ECG-1250, ECG-2250, ECG-3250)

Cardiofax® M (ECG-1350, ECG-2350, ECG-3350)

Cardiofax® V (ECG-1500, ECG-1550)

Cardiofax® G (ECG-2450, ECG-2550)

These cardiographs use a TCP/IP connection directly to a customer receiver utility (EctpCore service), in combination with an FTP connection for both the order queries and to send the EKG. The FTP Server built into Windows Server with IIS can be used; however, if Philips carts are also in use then IIS Web Services must be disabled. We have tested the open source program FileZilla and it works very well for this purpose, but any other FTP server should also work. All of 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 Nihon Kohden representative for the approved instructions.

The most common search criterion is the DepartmentName field, but this DEVICE doesn't support that field. You can use DeviceID for this instead with the following Order Request Field Mapping entry:

DepartmentName=DeviceID

Alternatively, if ***all*** carts of this type are in a single department, field mapping can be used to hardcode the department setting. You can also use the REGMAP functionality to convert numbers to names – see *Chapter 4* for an example.

Along with the software from DLLC, the *NK EctpCore Setup* program will be supplied. This software was written by Nihon Kohden (Japan) and other than the information presented here DLLC has no other information or control over it. This utility application runs as a Windows service.

To set up *EctpCore*, do the following:

1. Run the provided setup program and follow the prompts to install it.
2. From the *Start* menu, select *All Programs → NIHON KOHDEN Corporation → Ectp-SDK → Registrations*. This sets up the application.
3. From the *Start* menu, select *All Programs → NIHON KOHDEN Corporation → Ectp-SDK → Configuration*. This will open a window with the settings. Configure as specified below and then press ***OK***.
    a. In the ECTP section, *Output Directory* and *Work Directory* must match the *Input Folder* setting in DWL.
    b. *Log Directory* should be set to a different folder. This folder will accumulate log information from the utility **and must be cleaned out periodically.**
    c. *Port* is always ***30003***.
    d. *Timeout* must be set to ***60000***. If this value is too small the order query will not work.
    e. In the FTP section, *IP Address* should be left as the loopback address (127.0.0.1).
    f. The *User Name* and *Password* are usually left as the default values but may be changed as needed. This must match the user account set up the FTP server.
    g. *Alias* should be left as the default.
4. Open the Services applet and locate the EctpCore service. Make sure the Startup Type is Automatic and then manually start the service.

Set up the desired FTP server, then add a user and set the home path to match the *Input Folder* configured in DWL, and then set the permissions to full control (read/write/delete). For the user account, use the name and password configured above.

To configure the cart for use with DWL:

1. Press ***Menu*** and then ***System Settings***.
2. Select ***Communication Settings***.
3. Select ***Ethernet Settings***.
4. Enter the IP address of the Computer in both the *Ordering Server Address* and *File Server Address*.
5. Make sure that *Ordering Server Port* and *File Server Port* are set to ***30003***.
6. Use ***Register*** to exit each of the screens back to the main menu.
7. Press ***Exit*** on the main menu.

To retrieve the list of orders:

1. Press ***ID*** (a physical button).

To record an exam from the worklist and send it:

1. Select an order from the list that appeared and press the big green button.
2. After an EKG is taken, the buttons on the screen will change. Touch ***File*** and then ***Transfer*** to transmit the EKG. EKGs that are saved on the cardiograph can be transmitted by touching ***Menu***, then ***Data Management***, then selecting the desired EKG(s), touching ***Process***, and finally ***Transfer***.

Supported Fields

These are the DWL fields supported by this Device Type. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data returned to the DEVICE will typically be a subset of the Order Response list. Also recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field.

- **Order Request**
  - *Order Information Search Fields*
    - DeviceID
  - *Patient Information Search Fields*
    - PatientID
    - BirthDate
- **Order Response (shown on the cart and/or in the recorded EKG)**
  - *Order Information Fields*
    - DepartmentName
    - OrderNumber
    - RequestingPhysicianName
    - RoomNumber
  - *Patient Information Fields*
    - PatientID
    - PatientFName
    - PatientMName
    - PatientLName

- Age
- AgeUnits
- BirthDate
- Gender
- Race
- HeightCM
- WeightKG

Philips Healthcare

PageWriter® Touch and PageWriter® TC cardiographs

These cardiographs communicate using a TCP/IP connection directly to DWL. All of 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 Philips representative for the approved instructions.

When configuring DWL with Philips devices for queries, it is important to understand the term ***Inbox***. The ***Inbox*** corresponds to the *DepartmentName* field in DWL. During the cart configuration described below, the list of one or more ***Inboxes*** will be supplied by DWL to the cart. The cart will, in turn, use the selected ***Inbox*** value when the user requests a worklist. The list of orders returned by the SYSTEM will be filtered so that only orders marked for that Department Name will be returned. Note that the Philips devices do not allow a single query for multiple departments. There are two ways to specify the ***Inbox*** value(s):

- The simple way is to enter the text value(s) in the *Inbox:* field of the DWL configurator. Multiple entries should be separated by commas. This field can only hold a limited number of entries.
- Another method is to store the ***Inbox*** values in a file. For installations with many departments this offers the advantage that the list can contain far more entries and is easier to maintain. Another advantage to this is that it gives you the ability to limit the list of ***Inboxes*** returned to the cart based on the User Name configured on the cart.

  To use a file, use this syntax to enter the file reference and details:

  {Filename,InboxCol[,UserNameCol]}

  Where:

  Filename is the full filename (including path) of a file that contains rows of data. It can contain on a simple list or it can contain data in CSV (comma separated value) format.

  InboxCol is the column number (starting at 1) that contains the Inbox values. ***This is required***.

UserNameCol is the column number (starting at 1) that contains the UserName that has access to the Inbox on this row. The UserName can be specified on the DEVICE. Blank matches anything. This is optional.

The square brackets indicate optional settings, which means that there are 2 variations of this syntax. Here are examples of each along with sample data:

{C:\Temp\SampleMap.csv,2}

With this syntax DWL will use the ***Inbox*** values from the specified column (2 in this example).

{C:\Temp\SampleMap.csv,1,2}

With this syntax DWL will use the ***Inbox*** values from the specified column (1 in this example) and it will limit the list of values to only those rows where the value in the *UserNameCol* (2 in this example) match the User Name that is configured on the cart and sent in the order query.

An important thing to note is that the file used for this list can also be used for a FILEMAP field mapping so that you can have a single file containing the list of departments along with the corresponding mapped value.

This method can be complex so we recommend that you contact DLLC for assistance with this type of configuration.

Set up DWL and make sure it is running before setting up the carts because it is needed for step 15. The default *Listener URL* should be used unless there is a specific reason not to.

Firmware versions prior to A.07 had an issue that prevented them from being able to query for orders when the cart is configured for filtered output. Philips recommends using A.07.03.07 or higher, and DLLC no longer provides details of the workaround required for older firmware versions.

To configure the cart for use with DWL:

1. On the main screen touch ***Setup***.
2. Touch ***Configure Cardiograph Default Settings***.
3. Touch the ***Algorithm/Pacing*** button at the top.
4. Under *Algorithm* there are two choices. Philips recommends always using the latest available in the list.
5. Touch the ***Filter*** button at the top.
6. Under *Optional Filter* make sure the *Baseline Wander* filter is ***ON***.
7. Touch ***Exit***, and then ***Yes*** in the message screen to save these changes.
8. Touch ***Configure ECG Network Settings***.
9. Touch the ***LAN/WLAN Settings*** button at the top. Check these settings and update them as appropriate.
10. Touch the ***ECG Mgmt Systems*** button at the top.
11. Touch the ***Edit/Delete TraceMaster*** button in the second row.
12. In the *Select TraceMaster Server* picklist, choose the default entry (typically ***TMVUE***) and touch ***Edit***. If there are no entries in the picklist, touch the ***Create***

TraceMaster button in the second row. The setup will be the same except you will name the entry when you save.

13. Set or update the following settings:
    a. Set *System Type* to ***ECG Management***.
    b. Set *Connectivity Settings* to ***Server Settings***.
    c. Set the Server URL to http://<IPAddress>/emscomm, where <IPAddress> is the address of the Computer. Use of a port other than the default 80 is supported when using http. If using an alternate port ensure that it is specified in all carts as well as the *Listener URL* in DWL.
    d. If *User Name* will be used to filter the list of Inboxes then set it to an appropriate value. *Password* is not used, but both *User Name* and *Password* **must** have a value in the fields. *Computer Name* should be set to the name of the Computer.
    e. The four buttons on the right should all be ***OFF***.
    f. Under *ECG Mgmt Version – Filtered ECG*, choose one of the ***Other EMS - XML*** selections.
    g. Touch ***Save Settings*** to save the changes.
    h. To test the cart connectivity with DWL running you can do a manual Time Sync from the cart.
14. Press the ***OrderVue Settings*** tab and select the *TraceMaster Server* that you just configured.
15. Under the ***Available Outboxes*** press the ***Refresh*** button. This will retrieve the selection(s) entered as *Inbox* in the DWL configuration. If nothing appears, there is a problem in the DWL configuration or the cart communication settings.
16. Select the desired inbox and press the right arrow button to move it to the ***Selected Outboxes*** area. Press ***Save Settings*** and name this configuration.
17. Touch ***Exit*** and then ***Exit*** again to return to the main screen.

To retrieve the list of orders:

1. On the main screen touch ***ID***.
2. Choose the ***Worklist*** tab, select the *Inbox* that you set up and press ***Get Worklist***. This will query DWL which will in turn query the Output System for the actual list of orders. **IMPORTANT NOTE: If you have taken any orders from the worklist and saved them to the Archive but not sent them, you will get an error when you retrieve the worklist again. This is because the same orders are being returned in the worklist. Once you have sent the exam to the Output System, you should manually delete all of the orders and then re-query for them when ready. The order that was completed will not be returned in the next worklist query**.
3. Optionally, you may enter specific query criteria on the ***Find Patient*** tab. You will still need to select the *Inbox* that you set up, but you can also enter various criteria.
4. You should now have a list of orders on the screen which can be taken as needed.

To record an exam from the worklist and send it:

1. From the worklist screen, choose a list item and then press the ***Select*** button at the bottom. This will load the patient information and return you to the main screen.
2. Record the exam normally (using the ***ECG*** button). On the displayed exam, you can either save it to the archive for later transmission (using the ***Save*** button), or transmit it immediately (using the ***Transfer*** button).

A barcode reader can be used to query from the cart using either the Patient ID or the Account / Visit Number. Patient ID search works with most systems, but Account / Visit Number search works with very few systems, mainly some DICOM-based systems. Because of the fact that IntelliBridge Enterprise (IBE) and IntelliSpace ECG (iECG or ISECG) are separate systems, use of the barcode to query requires that two TraceMaster Server entries be configured on the cart. Consult the device user manual and/or Philips support for details of how to do this. Both entries will point to DWL. Ensure that the entry set up for IBE is configured as Primary in the Inbox settings so that barcoding will work.

When interacting with DICOM SYSTEMs, if the Study Instance UID (SIUID) is too long then the cart can get confused and access the wrong patient. This is due to a field length limitation in the cart. A workaround is to add this Order Response Field Mapping entry:

RecordUniqueID=OrderNumber

IMPORTANT NOTE: IIS Web Services must not be installed on the Computer. DRCV02 can be running but only if the listeners for DWL and DRCV02 are using different ports.

Supported Fields

These are the DWL fields supported by this Device Type. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data returned to the DEVICE will typically be a subset of the Order Response list. Also recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field.

- **Order Request**
  - *Order Information Search Fields*
    - AccountNumber
    - DepartmentName *Inbox*
    - DeviceID
    - OrderNumber
    - Priority
    - RoomNumber
  - *Patient Information Search Fields*
    - PatientID
    - PatientFName

        - PatientMName
        - PatientLName
        - BirthDate
- **Order Response from the Worklist tab (shown on the cart and/or in the recorded EKG)**
    - *Order Information Fields*
        - AccountNumber
        - BedNumber
        - DepartmentID
        - DepartmentName
        - DeviceID
        - EncounterNumber
        - FacilityID
        - FacilityName
        - InstitutionID
        - InstitutionName
        - OrderBillingCode
        - OrderNumber
        - OrderReason
        - OrderRequestDate
        - OrderRequestTime
        - OrderStatus
        - PerformingPhysicianID
        - PerformingPhysicianName
        - Priority
        - RecordUniqueID *Returned as UniqueOrderID (32 characters max)*
        - ReferringPhysicianID
        - ReferringPhysicianName
        - RequestingPhysicianID
        - RequestingPhysicianName
        - RoomNumber
        - TechnicianID
        - TechnicianName
        - UnitNumber
    - *Patient Information Fields*
        - PatientID
        - PatientFName
        - PatientMName
        - PatientLName
        - Age
        - AgeUnits
        - BirthDate
        - BirthTime

        - Gender
        - Race
        - ImperialMetricUnits
        - HeightCM/HeightIN
        - WeightKG/WeightLB
- **Order Response from the Find Patient tab**
    - *Order Information Fields*
        - AccountNumber
        - BedNumber
        - DeviceID
        - OrderNumber
        - OrderRequestDate
        - OrderRequestTime
        - OrderStatus
        - Priority
        - RecordUniqueID *Returned as UniqueOrderID (32 characters max)*
        - RoomNumber
        - UnitNumber
    - *Patient Information Fields*
        - PatientID
        - PatientFName
        - PatientMName
        - PatientLName
        - BirthDate
        - Gender
        - ImperialMetricUnits
        - HeightCM/HeightIN
        - WeightKG/WeightLB

SCHILLER AG

CARDIOVIT® AT-10 plus, AT-102, AT-102 plus, AT-170, FT-1, AT-102 G2, CS-104, CS-200, CS-200 Office, CS-200 Touch, CS-200 Excellence, MS-2007, MS-2010, and MS-2015 cardiographs

These cardiographs communicate using a TCP/IP connection directly to DWL. All of 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 SCHILLER representative for the approved instructions.

The most common search criterion is the DepartmentName field, but this DEVICE doesn't support that field. You can use DeviceID for this instead with the following Order Request Field Mapping entry:

DepartmentName=DeviceID

Alternatively, if ***all*** carts of this type are in a single department, field mapping can be used to hardcode the department setting. You can also use the REGMAP functionality to convert numbers to names – see *Chapter 4* for an example.

When setting up DWL, the default *Listener URL* will normally match the default cart setting, but both can be changed as desired. The instructions below assume the default setting.

To configure the cart for use with DWL:

1. From the main screen, touch the ***Menu*** button 2x fast to reveal the ***Settings*** button and press it.
2. Touch ***System***, then ***Communication***.
3. Touch ***Interface*** and choose "Ethernet/WLAN".
4. Touch ***Com-Type*** and choose "---".
5. Touch ***Server*** and enter the following:
    a. The IP address of the Computer and set the port to ***8080***.
    b. The Page should be ***/SCS/SCSServlet***.
    c. The User Name and Password should be pre-configured.
6. Touch ***TCP/IP Settings*** or WLAN as appropriate and enter the IP Address/Net Mask/Gateway to assign to this cart.
7. Touch ***Back*** to return to ***System Settings***.
8. Touch ***Software*** and then ***Save as Default*** to load the changes you just made on the cart, you will see a scroll bar indicating it is saving the changes. Touch ***Back*** to get out of the screen.

To retrieve the list of orders:

1. On the main screen touch ***Menu***, ***Worklist***, and then ***Sync***.

To record an exam from the worklist and send it:

1. On the main screen touch ***Menu*** and then ***Worklist.*** Touch the desired order to select it and there will be a pop-up screen for that order. Touch ***Perform*** and then touch ***Start***.
2. The screen will go back to the Worklist screen and the order that was just taken should be highlighted in green. Touch ***Sync*** to send the order.
3. Note that orders that are taken are not saved to memory.

Supported Fields

These are the DWL fields supported by this Device Type. Keep in mind that not all SYSTEMs can return all of the supported Order Response fields, so the actual data returned to the DEVICE will typically be a subset of the Order Response list. Also

recognize that the search fields in the Order Request will only be used if they are not blank and if the SYSTEM returns data in the corresponding response field.

- **Order Request**
  - *Order Information Search Fields*
    - DeviceID
  - *Patient Information Search Fields*
    - PatientID
- **Order Response (shown on the cart and/or in the recorded EKG)**
  - *Order Information Fields*
    - DepartmentID
    - DepartmentName
    - DeviceID
    - InstitutionID
    - InstitutionName
    - OrderNumber
    - ReferringPhysicianID
    - ReferringPhysicianName
    - RequestingPhysicianID
    - RequestingPhysicianName
    - RoomNumber
    - TechnicianID
    - TechnicianName
  - *Patient Information Fields*
    - PatientID
    - PatientFName
    - PatientMName
    - PatientLName
    - BirthDate
    - Gender
    - Race
    - HeightCM
    - WeightKG

CHAPTER 6 – SYSTEM TYPES

The DWL application will communicate with a number of host systems. The following sections describe each supported system and detail any special installation/configuration requirements. ***The information presented is for use in configuration of DWL and does not imply endorsement of the referenced vendor***.

Note for systems using DICOM® EKG storage: These systems normally require that the Study Instance UID (SIUID) sent in the order list be returned in the EKG that is stored. If these don't match then the system cannot associate the order and EKG properly. Most non-DICOM® devices are not able to receive the SIUID in the order list and return it in the EKG, and some carts put a value in this field that is not a valid UID at all. To handle this requirement, DWL saves data from the order list and DFT updates certain values (including SIUID) as the EKG record is converted to DICOM® format. EKGs initiated using the order list will have the correct SIUID retrieved from context automatically, but for ad-hoc EKGs (entered manually from the cart) there is no context. Because of that, if the cart sends an invalid UID then the SYSTEM will reject the EKG. DFT performs a check of the UID value and will discard invalid values then generate a new UID.

These SYSTEMs have been validated with DWL.

Baxter / Hillrom (Epiphany, Mortara®)

Baxter Cardio Server

This management system supports DICOM Modality Worklist (C-FIND) functionality and has been validated to work with DWL. The software is normally installed on the Cardio Server server. For EKG Send functionality, the *Output Format* in DFT must be configured to ***Epiphany – Cardio Server***, and the *Output Folder* must be set to the folder that Cardio Server® is monitoring for incoming EKGs.

This system uses the concept of "Device ID" to segment data. In the Order Query, this Device ID comes from the DICOM® field *Institution Name*. To get data back there must be a value in this field. If the cart doesn't send this value and there is no REGMAP lookup table to get this value, add the following Order Request Field Mapping entry:

InstitutionName="DatamedWL"

On the *Search Criteria* tab leave *InstitutionID* as ***Ignore*** and set both *InstitutionName* and *OrderNumber* to ***External***.

Epiphany support personnel will assist in configuring Cardio Server properly to handle these queries. When using multiple *InstitutionName* values to get subsets of data, the *SearchStartDatetime* and *SearchEndDatetime* must NOT be sent to Cardio Server. To handle this, change both fields to ***Internal*** on the *Search Criteria* tab.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - PatientLocation *(0038,0300) Current Patient Location*
    - DeviceID *(0018,1003) Station Name*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name* ***[Device ID]***
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - OrderReason *(0008,1030) Study Description*
    - OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
    - OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
    - PerformingPhysicianName *(0008,1050) Performing Physician's Name*
    - Priority *(0040,1003) Requested Procedure Priority*
    - RecordUniqueID *(0020,000D) Study Instance UID*
    - ReferringPhysicianName *(0008,0090) Referring Physician's Name*

- RequestingPhysicianName *(0032,1032) Requesting Physician*
- RoomNumber *(0038,0400) Patient's Institutional Residence*
- TechnicianName *(0008,1070) Operator's Name*

- *Patient Information Fields*
  - PatientID *(0010,0020) Patient ID*
  - SecondaryPatientID *(0010,1000) Other Patient IDs*
  - PatientFName *(0010,0010) Patient's Name*
  - PatientMName *(0010,0010) Patient's Name*
  - PatientLName *(0010,0010) Patient's Name*
  - Age *(0010,1010) Patient's Age*
  - BirthDate *(0010,0030) Patient's Birth Date*
  - BirthTime *(0010,0032) Patient's Birth Time*
  - Gender *(0010,0040) Patient's Sex*
  - Race *(0010,2160) Ethnic Group*
  - HeightCM *(0010,1020) Patient's Size*
  - WeightKG *(0010,1030) Patient's Weight*

Pyramis®

For this management system the software will typically be installed on the SYSTEM server. DWL communicates with Pyramis™ using its proprietary TCP/IP interface for order queries and to transmit the EKGs. The *Output Format* in DFT must be configured to ***Mortara (CSC) - Pyramis***.

Setting up DWL for order query requires several parameters:

- *System URL*. This is the URL to the Pyramis™ listener, normally: http://{Server IP}/PyramisWeb/UserWebApi.asmx.
- *Workstation ID*. This parameter identifies DWL to the Pyramis™ server.
- *User* and *Password*. These are the login credentials for the connection.
- *Inst ID*. This parameter is required for the Pyramis™.

Before you can query for orders you must register DWL with the Pyramis™. This is only done once and once it is successful the *Register* button text will change from red to green. Use the *Test* button to confirm connectivity to Pyramis™.

At this time Edan cardiographs do not supply Order Number so it is not possible to confirm EKGs from those carts in Pyramis™ except by manually attaching the order. You can manually attach an order to a test without an order by using the modality of the test, MRN and/or Acct #. To do this first load the EKG into the Pyramis Editor. Next select Actions/Orders and this will display the Attach/Detach order dialog. It will display a list of possible order matches (by modality, MRN or Acct #) and you can select an order from the list to "Attach" it to the EKG. This process will overwrite some demographic information because the values from the EMR take precedence over what was entered on the cardiograph.

Supported Fields

These are the fields supported by DWL for this SYSTEM. Keep in mind that the DEVICEs may not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AccountNumber
    - DepartmentName
    - InstitutionID
    - Modality
    - Priority
  - *Patient Information Search Fields*
    - PatientID
    - PatientFName
    - PatientLName
- **Order Response**
  - *Order Information Fields*
    - AccountNumber
    - AttendingPhysicianName
    - DepartmentName
    - EncounterNumber
    - InstitutionID
    - Modality
    - OrderNumber
    - OrderRequestDate
    - OrderRequestTime
    - OrderStatus
    - ReferringPhysicianID
    - ReferringPhysicianName
    - RequestingPhysicianID
    - RequestingPhysicianName
    - RoomNumber
  - *Patient Information Fields*
    - PatientID
    - SecondaryPatientID
    - PatientFName
    - PatientLName
    - Age
    - AgeUnits
    - BirthDate
    - BirthTime
    - Gender

- Race

Carestream Health, Inc.

Carestream® Cardiology PACS

This management system supports DICOM Modality Worklist (C-FIND) functionality and has been validated to work with DWL. It also supports the C-STORE transactions and can properly render ECG Waveform object. The software may be installed on the server (if permitted) or on another computer located on the network. Transmission to the system is via standard DICOM® network protocols. Be sure to review the note for DICOM® systems at the beginning of this chapter.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - PatientLocation *(0038,0300) Current Patient Location*

- DeviceID *(0018,1003) Station Name*
- DepartmentName *(0008,1040) Institutional Department Name*
- EncounterNumber *(0038,0010) Admission ID*
- InstitutionName *(0008,0080) Institution Name*
- Modality *(0008,0060) Modality*
- OrderNumber *(0008,0050) Accession Number*
- OrderReason *(0008,1030) Study Description*
- OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
- OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
- PerformingPhysicianName *(0008,1050) Performing Physician's Name*
- Priority *(0040,1003) Requested Procedure Priority*
- RecordUniqueID *(0020,000D) Study Instance UID*
- ReferringPhysicianName *(0008,0090) Referring Physician's Name*
- RequestingPhysicianName *(0032,1032) Requesting Physician*
- RoomNumber *(0038,0400) Patient's Institutional Residence*
- TechnicianName *(0008,1070) Operator's Name*

- *Patient Information Fields*
  - PatientID *(0010,0020) Patient ID*
  - SecondaryPatientID *(0010,1000) Other Patient IDs*
  - PatientFName *(0010,0010) Patient's Name*
  - PatientMName *(0010,0010) Patient's Name*
  - PatientLName *(0010,0010) Patient's Name*
  - Age *(0010,1010) Patient's Age*
  - BirthDate *(0010,0030) Patient's Birth Date*
  - BirthTime *(0010,0032) Patient's Birth Time*
  - Gender *(0010,0040) Patient's Sex*
  - Race *(0010,2160) Ethnic Group*
  - HeightCM *(0010,1020) Patient's Size*
  - WeightKG *(0010,1030) Patient's Weight*

Cerner Corporation (Oracle)

PowerChart® ECG

This management system supports DICOM Modality Worklist (C-FIND) functionality and has been validated to work with DWL. It also supports the C-STORE transactions and can properly render ECG Waveform object. The software may be installed on the server (if permitted) or on another computer located on the network. Transmission to the system is via standard DICOM® network protocols. Be sure to review the note for DICOM® systems at the beginning of this chapter.

To control the data returned in the order query, you will normally use the institution and department. For carts that only send a number (such as GE® MAC® carts) the number must

be converted to a name and put in the right field. These two Order Request Field Mapping entries will by typical:

PatientLocation=DepartmentID{REGMAP,...}
InstitutionName=InstitutionID{REGMAP,...}

The "…" portions should be the appropriate registry path. See *Chapter 4* for an example of what to enter and how to set up the registry map table. For this system, the registry map entries can contain wildcards (e.g. "ER*"), but in that case the field on the Search Criteria tab (*PatientLocation* or *InstitutionID*) **must** be set to *External*. This configuration can be confusing at first so we recommend allowing DLLC support to assist in getting it all set up.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - DeviceID *(0018,1003) Station Name*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*

- Modality *(0008,0060) Modality*
- OrderNumber *(0008,0050) Accession Number*
- OrderReason *(0008,1030) Study Description*
- OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
- OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
- PatientLocation *(0038,0300) Current Patient Location*
- PerformingPhysicianName *(0008,1050) Performing Physician's Name*
- Priority *(0040,1003) Requested Procedure Priority*
- RecordUniqueID *(0020,000D) Study Instance UID*
- ReferringPhysicianName *(0008,0090) Referring Physician's Name*
- RequestingPhysicianName *(0032,1032) Requesting Physician*
- RoomNumber *(0038,0400) Patient's Institutional Residence*
- TechnicianName *(0008,1070) Operator's Name*

- *Patient Information Fields*
  - PatientID *(0010,0020) Patient ID*
  - SecondaryPatientID *(0010,1000) Other Patient IDs*
  - PatientFName *(0010,0010) Patient's Name*
  - PatientMName *(0010,0010) Patient's Name*
  - PatientLName *(0010,0010) Patient's Name*
  - Age *(0010,1010) Patient's Age*
  - BirthDate *(0010,0030) Patient's Birth Date*
  - BirthTime *(0010,0032) Patient's Birth Time*
  - Gender *(0010,0040) Patient's Sex*
  - Race *(0010,2160) Ethnic Group*
  - HeightCM *(0010,1020) Patient's Size*
  - WeightKG *(0010,1030) Patient's Weight*

Change Healthcare (Optum)

Change Healthcare Cardiology™

This management system supports DICOM Modality Worklist (C-FIND) functionality and has been validated to work with DWL. The software is normally installed on the Change Healthcare server. For EKG Send functionality, the *Output Format* in DFT must be configured to ***Change Healthcare Cardiology***, and the *Output Folder* must be set to the folder that Change Healthcare Cardiology™ is monitoring for incoming EKGs.

For a typical installation you will want to add this Order Request Field Mapping entry:

Modality="ECG"

And you will want these Search Criteria settings:

Set *DepartmentName* to *External*

Set *Modality* to *External*

Multi-Facility Filtering with Philips cardiographs: There are some special configuration settings that allow a Philips cart to request orders only from a specific Facility. This functionality uses a different AE Title for each Facility, as configured in the MMC MWL Authorized Clients in Change Healthcare Cardiology™. Note that the AE Title **cannot** contain spaces.

1. In DatamedWLConfig, select ***Philips - PageWriter® Touch/TC*** as the *Device Type*, and then change the *Listener URL* from http://+/emscomm/ to http://+/. On the *Advanced* tab enable ***Use URL Suffix as AE Title***. Alternatively you can set *Local AE Title* to ***[URLPath]*** in the *Order Query* section.
2. On the Philips cart, the desired Facility's AE Title will be configured in place of ***"emscomm"*** as part of the *Server URL* described in 13.c of the Philips DEVICE instructions above. For example, if the Computer has an IP address of 10.1.4.22 and the Facility's AE Title is ***DWL_Hospital1***, the *Server URL* should be set to http://10.1.4.22/DWL_Hospital1.
3. In the Change Healthcare Cardiology™ Facility Management screen, make sure the Facility's AE Title is assigned to the appropriate Facility Code.

IMPORTANT NOTE: Order Number is not part of the MCK EKG file format but DFT will always copy it to the 1st user field.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*

        - PatientFName *(0010,0010) Patient's Name*
        - PatientMName *(0010,0010) Patient's Name*
        - PatientLName *(0010,0010) Patient's Name*
        - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
    - *Order Information Fields*
        - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
        - PatientLocation *(0038,0300) Current Patient Location*
        - DeviceID *(0018,1003) Station Name*
        - DepartmentName *(0008,1040) Institutional Department Name*
        - EncounterNumber *(0038,0010) Admission ID*
        - InstitutionName *(0008,0080) Institution Name*
        - Modality *(0008,0060) Modality*
        - OrderNumber *(0008,0050) Accession Number*
        - OrderReason *(0008,1030) Study Description*
        - OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
        - OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
        - PerformingPhysicianName *(0008,1050) Performing Physician's Name*
        - Priority *(0040,1003) Requested Procedure Priority*
        - RecordUniqueID *(0020,000D) Study Instance UID*
        - ReferringPhysicianName *(0008,0090) Referring Physician's Name*
        - RequestingPhysicianName *(0032,1032) Requesting Physician*
        - RoomNumber *(0038,0400) Patient's Institutional Residence*
        - TechnicianName *(0008,1070) Operator's Name*
    - *Patient Information Fields*
        - PatientID *(0010,0020) Patient ID*
        - SecondaryPatientID *(0010,1000) Other Patient IDs*
        - PatientFName *(0010,0010) Patient's Name*
        - PatientMName *(0010,0010) Patient's Name*
        - PatientLName *(0010,0010) Patient's Name*
        - Age *(0010,1010) Patient's Age*
        - BirthDate *(0010,0030) Patient's Birth Date*
        - BirthTime *(0010,0032) Patient's Birth Time*
        - Gender *(0010,0040) Patient's Sex*
        - Race *(0010,2160) Ethnic Group*
        - HeightCM *(0010,1020) Patient's Size*
        - WeightKG *(0010,1030) Patient's Weight*

DICOM®

This setting is for any other management system that supports DICOM Modality Worklist (C-FIND) functionality. The software may be installed on the server (if permitted) or on another computer located on the network. Transmission to the system is via standard DICOM® network protocols. Be sure to review the note for DICOM® systems at the beginning of this chapter.

For the EKG Send functionality, the management system must support the DICOM® C-STORE transaction. And more importantly, it must be able to understand and render (for display or print) an ECG Waveform object. Any DICOM®-based system will probably be able to receive and store the EKG, but not all can render them.

Supported Fields

These are the fields supported for DWL for this System Type. It is important to note that each manufacturer may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - PatientLocation *(0038,0300) Current Patient Location*

- DeviceID *(0018,1003) Station Name*
- DepartmentName *(0008,1040) Institutional Department Name*
- EncounterNumber *(0038,0010) Admission ID*
- InstitutionName *(0008,0080) Institution Name*
- Modality *(0008,0060) Modality*
- OrderNumber *(0008,0050) Accession Number*
- OrderReason *(0008,1030) Study Description*
- OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
- OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
- PerformingPhysicianName *(0008,1050) Performing Physician's Name*
- Priority *(0040,1003) Requested Procedure Priority*
- RecordUniqueID *(0020,000D) Study Instance UID*
- ReferringPhysicianName *(0008,0090) Referring Physician's Name*
- RequestingPhysicianName *(0032,1032) Requesting Physician*
- RoomNumber *(0038,0400) Patient's Institutional Residence*
- TechnicianName *(0008,1070) Operator's Name*

- *Patient Information Fields*
  - PatientID *(0010,0020) Patient ID*
  - SecondaryPatientID *(0010,1000) Other Patient IDs*
  - PatientFName *(0010,0010) Patient's Name*
  - PatientMName *(0010,0010) Patient's Name*
  - PatientLName *(0010,0010) Patient's Name*
  - Age *(0010,1010) Patient's Age*
  - BirthDate *(0010,0030) Patient's Birth Date*
  - BirthTime *(0010,0032) Patient's Birth Time*
  - Gender *(0010,0040) Patient's Sex*
  - Race *(0010,2160) Ethnic Group*
  - HeightCM *(0010,1020) Patient's Size*
  - WeightKG *(0010,1030) Patient's Weight*

IMPORTANT NOTE: There are a number of other SYSTEMs that support DICOM® Modality Worklist and should be compatible with DWL; however they have not yet been validated. Transmission to the system is via standard DICOM® network protocols.

Esaote®

Suitestensa

This management system supports DICOM Modality Worklist (C-FIND) functionality and has been validated to work with DWL. For EKG Send functionality, the *Output Format* in DFT must be configured to ***Esaote - Suitestensa / Cardiology Org@nizer (esa)***, and the *Output Folder* must be set to the folder that Suitestensa is monitoring for incoming EKGs.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - PatientLocation *(0038,0300) Current Patient Location*
    - DeviceID *(0018,1003) Station Name*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name* ***[Device ID]***
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - OrderReason *(0008,1030) Study Description*
    - OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
    - OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
    - PerformingPhysicianName *(0008,1050) Performing Physician's Name*
    - Priority *(0040,1003) Requested Procedure Priority*
    - RecordUniqueID *(0020,000D) Study Instance UID*
    - ReferringPhysicianName *(0008,0090) Referring Physician's Name*

- RequestingPhysicianName *(0032,1032) Requesting Physician*
- RoomNumber *(0038,0400) Patient's Institutional Residence*
- TechnicianName *(0008,1070) Operator's Name*

- *Patient Information Fields*
  - PatientID *(0010,0020) Patient ID*
  - SecondaryPatientID *(0010,1000) Other Patient IDs*
  - PatientFName *(0010,0010) Patient's Name*
  - PatientMName *(0010,0010) Patient's Name*
  - PatientLName *(0010,0010) Patient's Name*
  - Age *(0010,1010) Patient's Age*
  - BirthDate *(0010,0030) Patient's Birth Date*
  - BirthTime *(0010,0032) Patient's Birth Time*
  - Gender *(0010,0040) Patient's Sex*
  - Race *(0010,2160) Ethnic Group*
  - HeightCM *(0010,1020) Patient's Size*
  - WeightKG *(0010,1030) Patient's Weight*

Fujifilm Medical Systems

VidiStar® PACS and Online Reporting Software

This management system supports DICOM Modality Worklist (C-FIND) functionality and has been validated for use with DWL. It also supports the C-STORE transactions and can properly render ECG Waveform object. The software may be installed on the server (if permitted) or on another computer located on the network. Transmission to the system is via standard DICOM® network protocols. Be sure to review the note for DICOM® systems at the beginning of this chapter.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*

        - OrderNumber *(0008,0050) Accession Number*
        - PatientLocation *(0038,0300) Current Patient Location*
        - Priority *(2200,0020) Request Priority*
        - RoomNumber *(0038,0400) Patient's Institutional Residence*
    - *Patient Information Search Fields*
        - PatientID *(0010,0020) Patient ID*
        - SecondaryPatientID *(0010,1000) Other Patient IDs*
        - PatientFName *(0010,0010) Patient's Name*
        - PatientMName *(0010,0010) Patient's Name*
        - PatientLName *(0010,0010) Patient's Name*
        - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
    - *Order Information Fields*
        - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
        - PatientLocation *(0038,0300) Current Patient Location*
        - DeviceID *(0018,1003) Station Name*
        - DepartmentName *(0008,1040) Institutional Department Name*
        - EncounterNumber *(0038,0010) Admission ID*
        - InstitutionName *(0008,0080) Institution Name*
        - Modality *(0008,0060) Modality*
        - OrderNumber *(0008,0050) Accession Number*
        - OrderReason *(0008,1030) Study Description*
        - OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
        - OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
        - PerformingPhysicianName *(0008,1050) Performing Physician's Name*
        - Priority *(0040,1003) Requested Procedure Priority*
        - RecordUniqueID *(0020,000D) Study Instance UID*
        - ReferringPhysicianName *(0008,0090) Referring Physician's Name*
        - RequestingPhysicianName *(0032,1032) Requesting Physician*
        - RoomNumber *(0038,0400) Patient's Institutional Residence*
        - TechnicianName *(0008,1070) Operator's Name*
    - *Patient Information Fields*
        - PatientID *(0010,0020) Patient ID*
        - SecondaryPatientID *(0010,1000) Other Patient IDs*
        - PatientFName *(0010,0010) Patient's Name*
        - PatientMName *(0010,0010) Patient's Name*
        - PatientLName *(0010,0010) Patient's Name*
        - Age *(0010,1010) Patient's Age*
        - BirthDate *(0010,0030) Patient's Birth Date*
        - BirthTime *(0010,0032) Patient's Birth Time*
        - Gender *(0010,0040) Patient's Sex*
        - Race *(0010,2160) Ethnic Group*
        - HeightCM *(0010,1020) Patient's Size*

- WeightKG *(0010,1030) Patient's Weight*

Synapse® Cardiovascular

This management system supports DICOM Modality Worklist (C-FIND) functionality and has been validated for use with DWL. It also supports the C-STORE transactions and can properly render ECG Waveform object. The software may be installed on the server (if permitted) or on another computer located on the network. Transmission to the system is via standard DICOM® network protocols. Be sure to review the note for DICOM® systems at the beginning of this chapter.

For EKG Send functionality when using the ESI format, the *Output Format* in DFT must be configured to ***Epiphany - Cardio Server***, and the *Output Folder* must be set to the folder that Cardio Server is monitoring for incoming EKGs.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*

- PatientLocation *(0038,0300) Current Patient Location*
- DeviceID *(0018,1003) Station Name*
- DepartmentName *(0008,1040) Institutional Department Name*
- EncounterNumber *(0038,0010) Admission ID*
- InstitutionName *(0008,0080) Institution Name*
- Modality *(0008,0060) Modality*
- OrderNumber *(0008,0050) Accession Number*
- OrderReason *(0008,1030) Study Description*
- OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
- OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
- PerformingPhysicianName *(0008,1050) Performing Physician's Name*
- Priority *(0040,1003) Requested Procedure Priority*
- RecordUniqueID *(0020,000D) Study Instance UID*
- ReferringPhysicianName *(0008,0090) Referring Physician's Name*
- RequestingPhysicianName *(0032,1032) Requesting Physician*
- RoomNumber *(0038,0400) Patient's Institutional Residence*
- TechnicianName *(0008,1070) Operator's Name*

- *Patient Information Fields*
  - PatientID *(0010,0020) Patient ID*
  - SecondaryPatientID *(0010,1000) Other Patient IDs*
  - PatientFName *(0010,0010) Patient's Name*
  - PatientMName *(0010,0010) Patient's Name*
  - PatientLName *(0010,0010) Patient's Name*
  - Age *(0010,1010) Patient's Age*
  - BirthDate *(0010,0030) Patient's Birth Date*
  - BirthTime *(0010,0032) Patient's Birth Time*
  - Gender *(0010,0040) Patient's Sex*
  - Race *(0010,2160) Ethnic Group*
  - HeightCM *(0010,1020) Patient's Size*
  - WeightKG *(0010,1030) Patient's Weight*

GE® Healthcare

MUSE® v7.1.1 or higher with the MUSEAPI3™ option, and MUSE® NX

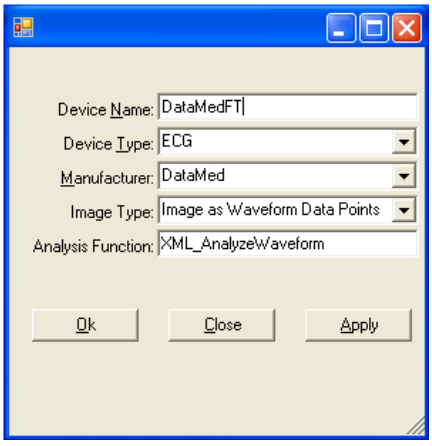
For this management system the software will be installed on a separate computer located on the network. DWL communicates with MUSE® using its proprietary TCP/IP interface. To set up the MUSE®, install MUSEAPI3™ and the XML Input Option. The \muse\xml folder must be shared using a domain account, and the DWL service set up to run under the same domain account. **This step is critical to allow the DWL service to write EKGs to the shared folder.**

The difference between the ***GE - MUSE (v7,v8,v9)*** System Type selection and the ***GE - MUSE (NX)*** System Type selection is only the default *System URL* setting. Also, MUSE NX requires an https connection which means that a certificate must be installed on both servers. **The URL for MUSE NX must use the computer name (or FQDN) not an IP address:** https://computername/MUSEAPIREST.

DWL supports querying for a contiguous Location range from the system (e.g. Locations "10-49"). The range must be in the *DepartmentID* field and it can be hardcoded in DWL, supplied directly from the source device, or more likely mapped from a text value sent by the source device. When using a range the Search Criteria for *DepartmentID* must be set to ***External***.

MUSEAPI3 Configuration for MUSE v7,v8,v9: Once MUSEAPI3™ is installed there is a MUSEAPI3™ configuration utility that sets up the End Point to listen for requests from DWL. In the *C:\Program Files\MUSE* folder there should be a utility named MUSEAPIServiceconfig.exe (contact GE support if it is not there). This program can be used to configure MUSEAPI3™ End Points after it has been installed. The default end point and port that DWL uses is HTTP and 8100. The DWL Configuration System URL must be appropriately configured to match this setting. The MUSEAPI3 service must be restarted after updating the settings. **NOTE: The *User* and *Password* credentials are for the internal MUSE® account, not the Windows account.**

XML Configuration: There is a MUSE configuration utility that must be set up to process XML files from DFT. In the *C:\Program Files\MUSE* folder there should be a utility named xmlconfig.exe (contact GE support if it is not there). After starting the program, select *DataMedFT* from the list and click ***Update Device*** (or press ***New Device*** if it is not present). Adjust/add the settings to match these:



The MUSE XML Parser service will need to be restarted after updating the settings.

Supported Fields

These are the fields supported by DWL for this SYSTEM. Keep in mind that the DEVICEs may not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - DepartmentID *Location number*
    - InstitutionID *Site number*
    - OrderNumber
  - *Patient Information Search Fields*
    - PatientID
- **Order Response**
  - *Order Information Fields*
    - AccountNumber
    - BedNumber
    - DepartmentID *Location ID*
    - DepartmentName *Location Name*
    - EncounterNumber *Visit Number*
    - OrderNumber
    - OrderRequestDate
    - OrderRequestTime
    - OrderStatus
    - Priority
    - RecordUniqueID *Order Identifier*
    - ReferringPhysicianName
    - RequestingPhysicianID
    - RequestingPhysicianName
    - RoomNumber
    - SecondaryPatientID
  - *Patient Information Fields*
    - PatientID
    - PatientFName
    - PatientLName
    - Age
    - AgeUnits
    - BirthDate
    - Gender
    - Race
    - HeightIN
    - HeightCM
    - WeightLB
    - WeightKG

INFINITT Healthcare Co

INFINITT Cardiology PACS

This management system supports DICOM® Modality Worklist (C-FIND) functionality and has been validated to work with DWL. It also supports the C-STORE transactions and can properly render ECG Waveform object. The software may be installed on the server (if permitted) or on another computer located on the network. Transmission to the system is via standard DICOM® network protocols. Be sure to review the note for DICOM® systems at the beginning of this chapter.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - PatientLocation *(0038,0300) Current Patient Location*
    - DeviceID *(0018,1003) Station Name*

- DepartmentName *(0008,1040) Institutional Department Name*
- EncounterNumber *(0038,0010) Admission ID*
- InstitutionName *(0008,0080) Institution Name*
- Modality *(0008,0060) Modality*
- OrderNumber *(0008,0050) Accession Number*
- OrderReason *(0008,1030) Study Description*
- OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
- OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
- PerformingPhysicianName *(0008,1050) Performing Physician's Name*
- Priority *(0040,1003) Requested Procedure Priority*
- RecordUniqueID *(0020,000D) Study Instance UID*
- ReferringPhysicianName *(0008,0090) Referring Physician's Name*
- RequestingPhysicianName *(0032,1032) Requesting Physician*
- RoomNumber *(0038,0400) Patient's Institutional Residence*
- TechnicianName *(0008,1070) Operator's Name*

o *Patient Information Fields*

- PatientID *(0010,0020) Patient ID*
- SecondaryPatientID *(0010,1000) Other Patient IDs*
- PatientFName *(0010,0010) Patient's Name*
- PatientMName *(0010,0010) Patient's Name*
- PatientLName *(0010,0010) Patient's Name*
- Age *(0010,1010) Patient's Age*
- BirthDate *(0010,0030) Patient's Birth Date*
- BirthTime *(0010,0032) Patient's Birth Time*
- Gender *(0010,0040) Patient's Sex*
- Race *(0010,2160) Ethnic Group*
- HeightCM *(0010,1020) Patient's Size*
- WeightKG *(0010,1030) Patient's Weight*

Intelerad (formerly LUMEDX Corporation)

HealthView ECG Manager

This management system supports DICOM® Modality Worklist (C-FIND) functionality and has been validated to work with DWL. The software is normally installed on the Lumedx server. For EKG Send functionality, the *Output Format* in DFT must be configured to ***Lumedx - HealthView ECG Manager***, and the *Output Folder* must be set to the folder that CardioECG™ is monitoring for incoming EKGs.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM

Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - PatientLocation *(0038,0300) Current Patient Location*
    - DeviceID *(0018,1003) Station Name*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name* ***[Device ID]***
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - OrderReason *(0008,1030) Study Description*
    - OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
    - OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
    - PerformingPhysicianName *(0008,1050) Performing Physician's Name*
    - Priority *(0040,1003) Requested Procedure Priority*
    - RecordUniqueID *(0020,000D) Study Instance UID*
    - ReferringPhysicianName *(0008,0090) Referring Physician's Name*
    - RequestingPhysicianName *(0032,1032) Requesting Physician*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
    - TechnicianName *(0008,1070) Operator's Name*

- *Patient Information Fields*
  - PatientID *(0010,0020) Patient ID*
  - SecondaryPatientID *(0010,1000) Other Patient IDs*
  - PatientFName *(0010,0010) Patient's Name*
  - PatientMName *(0010,0010) Patient's Name*
  - PatientLName *(0010,0010) Patient's Name*
  - Age *(0010,1010) Patient's Age*
  - BirthDate *(0010,0030) Patient's Birth Date*
  - BirthTime *(0010,0032) Patient's Birth Time*
  - Gender *(0010,0040) Patient's Sex*
  - Race *(0010,2160) Ethnic Group*
  - HeightCM *(0010,1020) Patient's Size*
  - WeightKG *(0010,1030) Patient's Weight*

Medimatic

ComPACS™

This management system supports DICOM® Modality Worklist (C-FIND) functionality and has been validated to work with DWL. It also supports the C-STORE transactions and can properly render ECG Waveform object. The software may be installed on the server (if permitted) or on another computer located on the network. Transmission to the system is via standard DICOM® network protocols. Be sure to review the note for DICOM® systems at the beginning of this chapter.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*

        - RoomNumber *(0038,0400) Patient's Institutional Residence*
    - *Patient Information Search Fields*
        - PatientID *(0010,0020) Patient ID*
        - SecondaryPatientID *(0010,1000) Other Patient IDs*
        - PatientFName *(0010,0010) Patient's Name*
        - PatientMName *(0010,0010) Patient's Name*
        - PatientLName *(0010,0010) Patient's Name*
        - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
    - *Order Information Fields*
        - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
        - PatientLocation *(0038,0300) Current Patient Location*
        - DeviceID *(0018,1003) Station Name*
        - DepartmentName *(0008,1040) Institutional Department Name*
        - EncounterNumber *(0038,0010) Admission ID*
        - InstitutionName *(0008,0080) Institution Name*
        - Modality *(0008,0060) Modality*
        - OrderNumber *(0008,0050) Accession Number*
        - OrderReason *(0008,1030) Study Description*
        - OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
        - OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
        - PerformingPhysicianName *(0008,1050) Performing Physician's Name*
        - Priority *(0040,1003) Requested Procedure Priority*
        - RecordUniqueID *(0020,000D) Study Instance UID*
        - ReferringPhysicianName *(0008,0090) Referring Physician's Name*
        - RequestingPhysicianName *(0032,1032) Requesting Physician*
        - RoomNumber *(0038,0400) Patient's Institutional Residence*
        - TechnicianName *(0008,1070) Operator's Name*
    - *Patient Information Fields*
        - PatientID *(0010,0020) Patient ID*
        - SecondaryPatientID *(0010,1000) Other Patient IDs*
        - PatientFName *(0010,0010) Patient's Name*
        - PatientMName *(0010,0010) Patient's Name*
        - PatientLName *(0010,0010) Patient's Name*
        - Age *(0010,1010) Patient's Age*
        - BirthDate *(0010,0030) Patient's Birth Date*
        - BirthTime *(0010,0032) Patient's Birth Time*
        - Gender *(0010,0040) Patient's Sex*
        - Race *(0010,2160) Ethnic Group*
        - HeightCM *(0010,1020) Patient's Size*
        - WeightKG *(0010,1030) Patient's Weight*

Neagen Oy

Neagan PACS

This management system supports DICOM® Modality Worklist (C-FIND) functionality and has been used with DWL. It also supports the C-STORE transactions and can properly render ECG Waveform object. The software may be installed on the server (if permitted) or on another computer located on the network. Transmission to the system is via standard DICOM® network protocols. Be sure to review the note for DICOM® systems at the beginning of this chapter.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - PatientLocation *(0038,0300) Current Patient Location*
    - DeviceID *(0018,1003) Station Name*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - EncounterNumber *(0038,0010) Admission ID*

- InstitutionName *(0008,0080) Institution Name*
- Modality *(0008,0060) Modality*
- OrderNumber *(0008,0050) Accession Number*
- OrderReason *(0008,1030) Study Description*
- OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
- OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
- PerformingPhysicianName *(0008,1050) Performing Physician's Name*
- Priority *(0040,1003) Requested Procedure Priority*
- RecordUniqueID *(0020,000D) Study Instance UID*
- ReferringPhysicianName *(0008,0090) Referring Physician's Name*
- RequestingPhysicianName *(0032,1032) Requesting Physician*
- RoomNumber *(0038,0400) Patient's Institutional Residence*
- TechnicianName *(0008,1070) Operator's Name*

o *Patient Information Fields*

- PatientID *(0010,0020) Patient ID*
- SecondaryPatientID *(0010,1000) Other Patient IDs*
- PatientFName *(0010,0010) Patient's Name*
- PatientMName *(0010,0010) Patient's Name*
- PatientLName *(0010,0010) Patient's Name*
- Age *(0010,1010) Patient's Age*
- BirthDate *(0010,0030) Patient's Birth Date*
- BirthTime *(0010,0032) Patient's Birth Time*
- Gender *(0010,0040) Patient's Sex*
- Race *(0010,2160) Ethnic Group*
- HeightCM *(0010,1020) Patient's Size*
- WeightKG *(0010,1030) Patient's Weight*

Novarad® Corporation

NovaCardio™ ECG

This management system supports DICOM® Modality Worklist (C-FIND) functionality and has been validated to work with DWL. It also supports the C-STORE transactions and can properly render ECG Waveform object. The software may be installed on the server (if permitted) or on another computer located on the network. Transmission to the system is via standard DICOM® network protocols. Be sure to review the note for DICOM® systems at the beginning of this chapter.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in

mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - PatientLocation *(0038,0300) Current Patient Location*
    - DeviceID *(0018,1003) Station Name*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - OrderReason *(0008,1030) Study Description*
    - OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
    - OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
    - PerformingPhysicianName *(0008,1050) Performing Physician's Name*
    - Priority *(0040,1003) Requested Procedure Priority*
    - RecordUniqueID *(0020,000D) Study Instance UID*
    - ReferringPhysicianName *(0008,0090) Referring Physician's Name*
    - RequestingPhysicianName *(0032,1032) Requesting Physician*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
    - TechnicianName *(0008,1070) Operator's Name*
  - *Patient Information Fields*
    - PatientID *(0010,0020) Patient ID*

- SecondaryPatientID *(0010,1000) Other Patient IDs*
- PatientFName *(0010,0010) Patient's Name*
- PatientMName *(0010,0010) Patient's Name*
- PatientLName *(0010,0010) Patient's Name*
- Age *(0010,1010) Patient's Age*
- BirthDate *(0010,0030) Patient's Birth Date*
- BirthTime *(0010,0032) Patient's Birth Time*
- Gender *(0010,0040) Patient's Sex*
- Race *(0010,2160) Ethnic Group*
- HeightCM *(0010,1020) Patient's Size*
- WeightKG *(0010,1030) Patient's Weight*

Philips® Healthcare

IntelliSpace™ ECG

For this management system the software will be installed on a separate computer located on the network. DWL communicates with IntelliBridge Enterprise™ (IBE) on the Philips® server using its proprietary TCP/IP interface. For EKG Send functionality, the *Output Format* in DFT must be configured to ***Philips - IntelliSpace ECG / TraceMasterVue (xml 1.04)***. DFT will handle the ECG after DWL has received it.

Philips will need to configure IBE and then provide the URL for the DWL configuration, along with the username and password.

Supported Fields

These are the fields supported by DWL for this SYSTEM. Keep in mind that the DEVICEs may not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AccountNumber
    - DepartmentName *Inbox*
    - DeviceID
    - EncounterNumber
    - Modality
    - OrderNumber
    - Priority
    - RoomNumber
  - *Patient Information Search Fields*
    - PatientID
    - SecondaryPatientID
    - PatientFName

        - PatientMName
        - PatientLName
        - BirthDate
- **Order Response**
    - *Order Information Fields*
        - AccountNumber
        - BedNumber
        - DepartmentID
        - DepartmentName
        - DeviceID
        - EncounterNumber
        - FacilityID
        - FacilityName
        - InstitutionID
        - InstitutionName
        - OrderBillingCode
        - OrderNumber
        - OrderReason
        - OrderRequestDate
        - OrderRequestTime
        - OrderStatus
        - PerformingPhysicianID
        - PerformingPhysicianName
        - Priority
        - RecordUniqueID
        - ReferringPhysicianID
        - ReferringPhysicianName
        - RequestingPhysicianID
        - RequestingPhysicianName
        - RoomNumber
        - TechnicianID
        - TechnicianName
        - UnitNumber
        - User1 – User8
    - *Patient Information Fields*
        - PatientID
        - PatientFName
        - PatientMName
        - PatientLName
        - Age
        - AgeUnits
        - BirthDate
        - BirthTime

- Gender
- Race
- ImperialMetricUnits
- HeightIN
- HeightCM
- WeightLB
- WeightKG

TraceMasterVue™

For this management system the software will be installed on a separate computer located on the network. DWL communicates with OrderVue™ on the TraceMasterVue™ (TMV) server using its proprietary TCP/IP interface. For EKG Send functionality, the *Output Format* in DFT must be configured to ***Philips - IntelliSpace ECG / TraceMasterVue (xml 1.04)***. DFT will handle the ECG after DWL has received it.

Philips will need to configure OrderVue™ and then provide the URL for the DWL configuration, along with the username and password.

Supported Fields

These are the fields supported by DWL for this SYSTEM. Keep in mind that the DEVICEs may not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AccountNumber
    - DepartmentName *Inbox*
    - DeviceID
    - OrderNumber
    - Priority
    - RoomNumber
  - *Patient Information Search Fields*
    - PatientID
    - PatientFName
    - PatientMName
    - PatientLName
    - BirthDate
- **Order Response**
  - *Order Information Fields*
    - AccountNumber
    - BedNumber
    - DepartmentID
    - DepartmentName

- DeviceID
- EncounterNumber
- FacilityID
- FacilityName
- InstitutionID
- InstitutionName
- OrderBillingCode
- OrderNumber
- OrderReason
- OrderRequestDate
- OrderRequestTime
- OrderStatus
- PerformingPhysicianID
- PerformingPhysicianName
- Priority
- RecordUniqueID
- ReferringPhysicianID
- ReferringPhysicianName
- RequestingPhysicianID
- RequestingPhysicianName
- RoomNumber
- TechnicianID
- TechnicianName
- UnitNumber
- User1 – User8

- *Patient Information Fields*
  - PatientID
  - PatientFName
  - PatientMName
  - PatientLName
  - Age
  - AgeUnits
  - BirthDate
  - BirthTime
  - Gender
  - Race
  - ImperialMetricUnits
  - HeightIN
  - HeightCM
  - WeightLB
  - WeightKG

ScImage®

PicomEnterprise™

This management system supports DICOM® Modality Worklist (C-FIND) functionality and has been validated to work with DWL. It also supports the C-STORE transactions and can properly render ECG Waveform object. The software may be installed on the server (if permitted) or on another computer located on the network. Transmission to the system is via standard DICOM® network protocols. Be sure to review the note for DICOM® systems at the beginning of this chapter.

Supported Fields

These are the fields supported by DWL for this SYSTEM. It is important to note that the SYSTEM may only support a subset of this list. Consult the manufacturer's DICOM Conformance Statement to confirm what it does and does not support. Also keep in mind that the DEVICEs will not accept all of the supported Order Response fields, so the actual data returned to the DEVICE will be a subset of the Order Response list.

- **Order Request**
  - *Order Information Search Fields*
    - AttendingPhysicianName *(0032,1032) Requesting Physician*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - DeviceID *(0018,1003) Station Name*
    - EncounterNumber *(0038,0010) Admission ID*
    - InstitutionName *(0008,0080) Institution Name*
    - Modality *(0008,0060) Modality*
    - OrderNumber *(0008,0050) Accession Number*
    - PatientLocation *(0038,0300) Current Patient Location*
    - Priority *(2200,0020) Request Priority*
    - RoomNumber *(0038,0400) Patient's Institutional Residence*
  - *Patient Information Search Fields*
    - PatientID *(0010,0020) Patient ID*
    - SecondaryPatientID *(0010,1000) Other Patient IDs*
    - PatientFName *(0010,0010) Patient's Name*
    - PatientMName *(0010,0010) Patient's Name*
    - PatientLName *(0010,0010) Patient's Name*
    - BirthDate *(0010,0030) Patient's Birth Date*
- **Order Response**
  - *Order Information Fields*
    - AttendingPhysicianName *(0008,1048) Physician(s) of Record*
    - PatientLocation *(0038,0300) Current Patient Location*
    - DeviceID *(0018,1003) Station Name*
    - DepartmentName *(0008,1040) Institutional Department Name*
    - EncounterNumber *(0038,0010) Admission ID*

- InstitutionName *(0008,0080) Institution Name*
- Modality *(0008,0060) Modality*
- OrderNumber *(0008,0050) Accession Number*
- OrderReason *(0008,1030) Study Description*
- OrderRequestDate *(0040,0002) Scheduled Procedure Step Start Date*
- OrderRequestTime *(0040,0003) Scheduled Procedure Step Start Time*
- PerformingPhysicianName *(0008,1050) Performing Physician's Name*
- Priority *(0040,1003) Requested Procedure Priority*
- RecordUniqueID *(0020,000D) Study Instance UID*
- ReferringPhysicianName *(0008,0090) Referring Physician's Name*
- RequestingPhysicianName *(0032,1032) Requesting Physician*
- RoomNumber *(0038,0400) Patient's Institutional Residence*
- TechnicianName *(0008,1070) Operator's Name*

o *Patient Information Fields*

- PatientID *(0010,0020) Patient ID*
- SecondaryPatientID *(0010,1000) Other Patient IDs*
- PatientFName *(0010,0010) Patient's Name*
- PatientMName *(0010,0010) Patient's Name*
- PatientLName *(0010,0010) Patient's Name*
- Age *(0010,1010) Patient's Age*
- BirthDate *(0010,0030) Patient's Birth Date*
- BirthTime *(0010,0032) Patient's Birth Time*
- Gender *(0010,0040) Patient's Sex*
- Race *(0010,2160) Ethnic Group*
- HeightCM *(0010,1020) Patient's Size*
- WeightKG *(0010,1030) Patient's Weight*

CHAPTER 7 – CONFIGURING DATAMEDFT™

The DWL application uses DFT to translate the EKG data from the source format to the destination format. By leveraging DFT in this way, an extremely flexible installation can be configured, including devices that are supported by DWL as well as devices that are not. Proper operation of this application depends on certain specific settings in the DFT configuration.

For each DWL process, a corresponding process must be configured in DFT. ***These must be the same Process Number in both DWL and DFT or it will not work***. If there are other devices used with DFT that are not used with DWL then those processes must be set up after the DWL-matching processes. Here is an example to make this clearer:

- The source devices are Edan, HP, and Philips cardiographs and the management system is Change Healthcare Cardiology.
- Set up DWL with Process 1 being Edan to Change Healthcare. Set up DFT with Process 1 being Edan (scp) to Change Healthcare Cardiology.
- Set up DWL with Process 2 being Philips to Change Healthcare. Set up DFT with Process 2 being Philips XML to Change Healthcare Cardiology.
- There is no process 3 in DWL. Set up DFT with Process 3 being HP to Change Healthcare Cardiology.

These are the key settings that must be configured in DFT:

- The ***Input format*** should be set to the equivalent value as the DWL ***Device Type***.
- The ***Input folder*** can be anything but must be a local folder.
- The ***Look in subfolders for files*** setting must be disabled.
- The ***Output format*** should be set to the equivalent value as the DWL ***Output System***.
- The ***Output folder*** can be anything but must be a local folder and different than ***Input folder***.
- The ***File naming*** option must be set to ***Original Filename***. Note that DFT does not allow underscores in the filename event with this setting, so DWL will change any underscores to hyphens. Note that for the Lumedx HealthView ECG Manager, and Philips TraceMasterVue outputs, this setting is disabled.
- Archiving will typically be turned on but this is not required.
- If the ***Output System*** is DICOM then on the ***Options*** tab the ***DICOM: SOP Class*** and ***Transfer Syntax*** options must match the settings on the ***Advanced*** tab in DWL.

CHAPTER 8 – TROUBLESHOOTING

When DWL is installed, a new Windows™ services named *DatamedWL* 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. The DatamedWLConfig 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 open, 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 several depending on the number of processes that are set up. 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.

There should be one message for each process as it starts. There should also be a message that says how many processes there are and gives the code version and License Key information along with the license details. This shows that the License Key is installed properly and the proper license was obtained.

When working with DLLC support personnel, a key piece of information is the configuration settings. To export these to a file to email DLLC, start the Configurator and select *File → Export settings to file* on the menu.

Another very helpful diagnostic tool is the *Help → About* screen in the Configurator. This screen will give detailed information about the licenses.

Commons Issues

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.

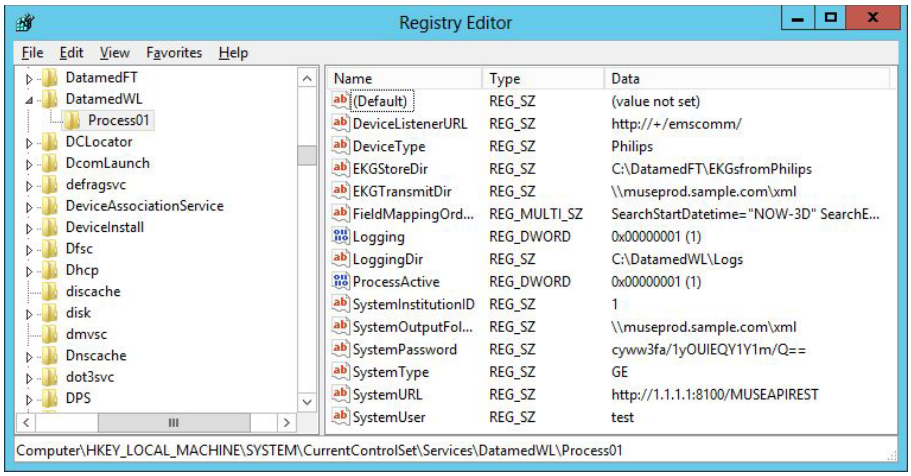
- For a Hardware License Key there is a light on the physical key that should be on if the driver is working.
- If the Security Key still can't be located or is marked as Cloned in the ACC, contact DLLC support.

- **Symptom: EKG records are going through but can't be found in the management system**
  - The first thing to look at here is the management system's logs to see if the record was imported but may have had a problem. Also check DFT's logs and the troubleshooting steps for DFT in the service manual.

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 DWL after installation, the DatamedWLConfig 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\DatamedWL. It should look similar to this:



Most of the settings must not be changed or the operation of DatamedWL will be affected. If any setting is changed the service must be restarted. A complete description of all configuration settings can be found in Chapter 3, and DLLC personnel will give instructions on what setting needs to be changed manually.

APPENDIX B – OPEN SOURCE LICENSE

Along with the software, a separate MDCM DLL is installed to handle the DICOM communications. This module is open source and is provided under the GNU Lesser General Public License (https://www.gnu.org/licenses/lgpl.html) with the following notice:

Copyright (c) 2006-2008 Mathieu Malaterre

Copyright (c) 1993-2005 CREATIS (CREATIS = Centre de Recherche et d'Applications en Traitement de l'Image)

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

- Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
- Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
- Neither name of Mathieu Malaterre, or CREATIS, nor the names of any contributors (CNRS, INSERM, UCB, Universite Lyon I), may be used to endorse or promote products derived from this software without specific prior written permission.
- Modified source versions must be plainly marked as such, and must not be misrepresented as being the original software.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHORS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

APPENDIX C – 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.

End-User License Agreement for Datamed® Software

IMPORTANT—READ CAREFULLY: This End-User License Agreement ("EULA") is a legal agreement between Datamed LLC ("Datamed") and the End User. Both you and the entity you act on behalf of in your capacity as an employee of such entity, or as an agent, contractor or representative of such entity shall be considered the End User for purposes of this EULA (collectively and individually, "you"). This EULA applies to the Datamed® software that accompanies this EULA, which may include associated media and printed and/or electronic documentation (individually and collectively, the "Product"). An amendment or addendum to this EULA may accompany the Product. No other person or entity personally or in any other capacity may acquire rights to use the Product pursuant to this EULA. **YOU AGREE TO BE BOUND BY THE TERMS OF THIS EULA BY AGREEING TO ACCEPT THE TERMS AND CONDITIONS OF THIS EULA, AND/OR BY INSTALLING, COPYING, OR USING THE PRODUCT. IF YOU ARE NOT WILLING TO ACCEPT THE TERMS AND CONDITIONS OF THIS EULA, THEN DECLINE TO ACCEPT AND REFRAIN FROM INSTALLING, COPYING OR USING THE PRODUCT.**

IN ADDITION TO THE TERMS SET FORTH HEREIN, YOU ALSO AGREE TO BE BOUND BY THE TERMS AND CONDITIONS FOR THE PURCHASE, SHIPPING AND DELIVERY OF DATAMED PRODUCTS THAT ARE POSTED ON DATAMED'S WEBSITE (WHICH CAN BE VIEWED AND/OR DOWNLOADED AT HTTPS://DATAMED.COM/DOCS/DATAMED_TERMS_CONDITIONS.PDF).

1. LICENSE AND USE.

1.1 Grant of License. In consideration for, and subject to, your agreement to the terms and conditions of this EULA, Datamed hereby grants to you a limited, non-exclusive, non-transferable, non-sublicensable license to use, and allow your employees and representatives, solely in their capacity as employees and representatives and for no other purposes ("Authorized Users"), to use the Product, in object code form only, for your own internal business purposes and subject to the terms and conditions contained herein. The Product can be licensed as (i) a fully-paid license or (ii) a subscription license that needs to be renewed periodically with the payment of additional subscription fees. A fully-paid license is not a perpetual license and it gives you a right to use the licensed version of the Product continuously until terminated by the terms and conditions set forth in this EULA. A subscription license gives you a right to use the Product for the time period set forth in the applicable invoiced order, or if no period is specified, for a time period of twelve (12) months from the date of installation. If a subscription license expires and is not renewed, you no longer have any further right to use the Product. If the relevant and applicable documentation does not specify which type of license you have, then your license shall be a subscription license.

1.2 Installation and Use for Protected Products. For each Product purchased, you may install and use a single instance of the Product on a single computer (physical or virtual). The Product is protected by either a Hardware License Key or a Software License Key to prevent the operation of the Product on more than one computer. By installing the Product you expressly agree to (a) the installation of the appropriate drivers for the Hardware or Software protection mechanism, and (b) not alter, modify or otherwise interfere with such protection systems, and (c) not attempt (or allow any other entity to attempt) to circumvent the protection or run the Product on more than one computer. You may transfer the Product between computers provided that it is used on only one computer owned and controlled by you at any given time for each Product purchased. You acknowledge and agree that any Hardware License Key or Software License Key that is lost or destroyed will not be replaced without additional charge.

1.3. Additional Servers. You need a Hardware License Key or Software License Key for each computer that a Product is installed on and used in an operating environment. Datamed offers an Additional Software License ("ASL") for a fee that comes in a Hardware License Key or a Software License Key and contains a duplicate of the production server license. An ASL can be used for testing, hot backup, or disaster recovery but cannot be used as a production server. You may install an inactive copy of a Product on an additional computer, as long as the Product is not used in an operating environment, unless and until you acquire another Hardware License Key or Software License Key or transfer a Hardware License Key or Software License Key in compliance with Section 1.2.

1.4 Connection Licenses. Certain Products (DatamedFT™ and DatamedWL™) consist of a license for a specific destination system connection (the "Base Software License") and one or more licenses for a specific source device connection ("Connection Licenses"). For these Products you must acquire the appropriate number and type of Connection License for each originating source device that accesses your instance of the Product directly or indirectly, and limit the count of such devices to the number of Connection Licenses purchased from Datamed. Upon request from time to time, but not more often than annually, you shall report to Datamed in writing an accurate inventory of all such devices, and shall not alter, modify or otherwise interfere with any mechanisms or routines in the Products that report device counts to Datamed. For Products that are licensed based on the number of source devices, use of each such Product with more devices than Connection Licenses is not allowed under this EULA and is a material breach of this EULA.

1.5 License Grant for Documentation. Any documentation that accompanies the Product is subject to the license set forth in Section 1.1 and may only be used for internal, non-commercial reference purposes only.

1.6 Use of the Product. You and Your Authorized Users agree to use the Product in compliance with all applicable federal, state, and local laws, rules, and regulations. You are solely responsible for the adequacy and accuracy of all data, programs, procedures, and other information that you and/or your Authorized Users input into the Software and the results obtained therefrom. You are fully responsible for making all treatment decisions and providing medical care with respect to all patients whose data may be processed using the Product. Your use of the Product does not constitute the rendering of medical care or advice by Datamed, Datamed and its staff are not medical providers and are not intended to replace the relationship between patients and their healthcare provider(s).

1.7 Lifetime of the License. Unless the term of any license subject to this EULA is determined pursuant to another written license agreement between you and Datamed, (a) the subscription license is limited by the subscription period, and (b) the fully-paid license is time-limited and will terminate on the second anniversary of the expiration of your support plan. As long as Datamed offers support plans for the Product, you may (a) renew your support plan prior to the second anniversary of the expiration of your previous support plan, or (b) restore your license by both paying a

reactivation fee (as identified on the then current published Price List), and renewing your support plan, either (a) or (b) result in extending the license for the duration of the current support plan and two years beyond.

1.8 Releases and Sunset of Product Versions. THE LATEST VERSIONS OF RELEASES OF ALL PRODUCTS ARE IDENTIFIED ON DATAMED'S WEBSITE (http://www.datamed.com). YOU ARE RESPONSIBLE FOR CHECKING TO SEE WHEN NEW RELEASES ARE AVAILABLE. Patch Releases (identified in Product version X.Y.Z by a change to the "Z" field) and Standard Releases (identified in Product version X.Y.Z by a change to the "Y" field) (individually, a "Release" and "collectively" Releases"), are created at Datamed's discretion and are available at no cost (a) to subscription licensees, and (b) to fully-paid licensees as long as a support plan for the associated Product is in force. In the event that a Release is a result of a mandatory regulatory change or to correct or mitigate an infringement claim, you will be notified and to the extent such Release is made available to you, you are required to update the Product to the new Release. If you fail to install such Release within the period prescribed by Datamed, you shall be solely responsible for, and Datamed shall have no liability regarding, any liability or damages incurred by you in connection with or arising from your failure to install such Release. All Releases sunset no later than twenty-four (24) months after being replaced by new release and Datamed is under no obligation to support any version after it is sunset.

1.9 **Sunset of Product**. Notwithstanding the foregoing, Datamed reserves the right to sunset any Product without notice.

2. RESERVATION OF RIGHTS AND OWNERSHIP. Datamed reserves all rights not expressly granted to you in this EULA. The Product is protected by copyright and other intellectual property laws and treaties. Datamed or its Representatives own the title, copyright, and other intellectual property rights in the Product and any copies thereof or derivative works thereto. **The Product is licensed, not sold.** This EULA does not grant you any rights to trademarks or service marks of Datamed. Notwithstanding anything herein to the contrary, you agree to not use or exploit the Product as a source or reference to conceive, create, develop or offer any product or service similar in form, function or concept to the Product.

3. FEEDBACK. Datamed may provide you with a mechanism to provide feedback, suggestions and ideas, if you choose, about its products and services ("Feedback"). You agree that Datamed may, in its sole discretion, use the Feedback you provide to Datamed in any way, including in future modifications of the Product. You hereby grant Datamed a perpetual, worldwide, fully transferable, irrevocable, royalty free license to use, modify, create and own derivative works from, distribute and display any information you provide to Datamed in the Feedback.

4. RESTRICTIONS; LIMITATIONS ON REVERSE ENGINEERING, DECOMPILATION, AND DISASSEMBLY. You are not licensed or permitted to do, nor may you permit your Authorized Users to:

(i) make additional copies of the Product except as provided herein;

(ii) give copies to another person who has not purchased a license for the Product from Datamed;

(iv) duplicate the Product by any other means including electronic transmission;

(v) reverse engineer, decompile, or disassemble the Product;

(vii) without the prior written consent of Datamed, transfer or assign the license and your rights to the Product under any circumstances including to an affiliate or any other entity under common ownership with you or under your control

or upon a merger, change of control, reorganization, consolidation or sale of all or substantially all of your assets or seek to sublicense or assign the license of your rights hereunder;

(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.

EULA Rev L