

# SETUP MANUAL

## ***Midmark Products over Thin Client using IQpath®***

Version 3.0



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## Related Documents:

- *Midmark IQecg® Operation Manual*  
(Part Number: 48-78-0002)
- *Midmark Digital Spirometer Operation Manual*  
(Part Number: 56-78-0001)
- *Midmark IQholter®, EX, EP Operation Manual*  
(Part Number: 39-78-0001)
- *Midmark Digital Vital Signs Device Operation Manual*  
(Part Number: 21-78-0001)
- *Midmark IQvitals Zone User Guide*  
(Part Number: 22-78-0002)
- *IQmanager® Software Operation Manual*  
(Part number: 62-78-0001)

All product Operation Manuals can also be downloaded from [midmark.com](http://midmark.com). For additional information contact [Midmark Technical Services](#).

## I. Introduction

The Midmark IQecg®, Midmark Digital Spirometer, Midmark Digital Vital Signs Device, IQvitals® Zone™, and IQholter® devices can be used in thin client or fat client (also called full client) environments.

This document contains recommended practices for end-users intending to deploy Midmark devices in thin client environments. The information in this document applies to users of the IQecg, Midmark Digital Spirometer, Midmark Digital Vital Signs Device, IQvitals Zone, and IQholter devices via the IQmanager software as well as for users of Electronic Medical Record (EMR) applications that have integrated these products. This document is appropriate for system administrators considering deployment of this software in a clinical environment, technical personnel responsible for installing and configuring the software and technical support personnel.

Midmark ECG, Spirometry, and Vitals products are inherently real-time applications, acquiring real-time data. Unlike running products on a fat client PC, data transmission could be delayed while running over a thin client network. Available bandwidth and other network performance parameters are major considerations in thin client environments.

**NOTE:** The Midmark IQholter software does not use IQpath to operate in a thin client environment. The IQholter software is not a real-time application and does not require the same network bandwidth or system resources as the IQecg, Midmark Digital Spirometer, Midmark Digital Vital Signs Device and IQvitals Zone devices. See [Section V, Recommendations for Holter](#).

### A. Cautionary Note

Midmark has tested the IQecg, Midmark Digital Spirometer, Midmark Digital Vital Signs Device, and IQvitals Zone devices using the Midmark IQpath software for both Microsoft Terminal Services and Citrix ICA thin client configurations in a variety of network conditions. Midmark has verified that the software works correctly when the network meets the minimum performance requirements specified in [Section II, Requirements](#) of this document.

Midmark will not be responsible if the network does not meet the minimum requirements. If the customer cannot determine that their network meets

the minimum requirements and wishes to deploy the Midmark IQecg, Midmark Digital Spirometer, Midmark Digital Vital Signs Device, and IQvitals Zone software in a thin client environment anyway, the customer must first test these products on their own network.

**NOTE:** Networked systems are complex and the addition of terminal servers and thin client software adds further complexity. Midmark highly recommends that the customer configure and test this software in a test environment prior to going live.

The minimum performance requirements specified in *Section II, [System Requirements](#)*, are established with the simulation on a wired thin client network and USB devices. Due to wireless (WiFi and BLE) devices being more prone to interference and instability, Midmark recommends using hardwire (Network Cable and USB) whenever possible. If hardwire is not an option, the customer has the responsibility to validate the wireless devices being used and revert to hardwire if there are any issues.

## II. Requirements

### A. System Requirements

**NOTE:** Since network structure, topology and platforms differ between thin client deployments, the following requirements may vary slightly. Midmark strongly recommends setting up a validated pilot project in a lab-environment before deploying in a production setting.

1. Server Operating Systems	
<ul style="list-style-type: none"> <li>Windows® Server 2016, 2008, 2008 R2, 2012, 2012 R2 (Standard / Enterprise Edition) <i>Service Packs or hot-fixes may be needed</i></li> </ul>	
2. Server Services / Software	
<ul style="list-style-type: none"> <li>Windows Terminal Services</li> <li>VMware Horizon® v7.3.1 or compatible (Standard/Advanced/Enterprise Edition)</li> <li>Citrix XenApp 7.6 or compatible. (<i>Citrix Server is required on non-Windows servers</i>)</li> </ul>	
3. Client	
<ul style="list-style-type: none"> <li>Desktop PCs (full client), laptops, notebook, tablet computers, or thin client terminals (for IQpath® the computer needs enough free space to install the required software)</li> </ul> <p><b>Note:</b> Ensure the thin client terminal is running a supported Windows OS and that the free space requirements are available on the local thin client terminal.</p>	
<ul style="list-style-type: none"> <li>Available USB port</li> </ul>	
<ul style="list-style-type: none"> <li>Windows® 10, Professional and Enterprise, 32-bit and 64-bit</li> <li>Windows® 8, Professional and Enterprise, 32-bit and 64-bit</li> <li>Windows® 7, Professional and Enterprise, 32-bit and 64-bit</li> <li>Windows® 7 and 2009 Embedded</li> </ul>	
<ul style="list-style-type: none"> <li>Microsoft Remote Desktop Connection,</li> <li>Citrix Receiver Version 14.2 or compatible.</li> <li>VMware Horizon® Client 4.6.1 or compatible (using Blast or PCoIP)</li> </ul>	
4. Available Network Bandwidth (Requirements may vary for different networking structures for a single user, upon validation in end-user environment)	
<ul style="list-style-type: none"> <li>IQecg® <ul style="list-style-type: none"> <li>Real-time Data Acquisition – See <a href="#">Section II-C.</a></li> <li>Report Review – no requirements</li> </ul> </li> </ul>	
<ul style="list-style-type: none"> <li>Midmark Digital Spirometer <ul style="list-style-type: none"> <li>Real-time Data Acquisition – See <a href="#">Section II-C.</a></li> </ul> </li> </ul>	

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- Report Review – no requirements



<ul style="list-style-type: none"> <li>• Midmark Digital Vital Signs Device and IQvitals Zone               <ul style="list-style-type: none"> <li>○ Real-time Data Acquisition – See <a href="#">Section II-C</a>.</li> <li>○ Record Review – no requirements</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• IQholter               <ul style="list-style-type: none"> <li>○ IQholter Data Acquisition– no requirements</li> <li>○ Record Review – no requirements</li> </ul> </li> </ul>

<b>5. ECG, Spirometry, Vitals, and Holter Devices (hardware)</b>
<ul style="list-style-type: none"> <li>• IQecg module – USB versions</li> <li>• Midmark Digital Spirometer handle – USB version</li> <li>• Midmark Digital Vital Signs Device or IQvitals Zone – serial port, USB, and BLE versions (connection types vary by product)</li> <li>• Compact Flash/SD Card reader for Holter products</li> <li>• Holter Security Key</li> </ul>

**Table 3-1 Minimum System Requirements**

## **B. Software Requirements**

### **Client Computer Software Requirements**

In order to use the Midmark IQpath® software you must install the following software on each client computer used for IQecg®, Midmark Digital Spirometer, Midmark Digital Vital Signs Device or IQvitals® Zone™ data acquisition.

<b>Thin Client Type</b>	<b>Client Software Required</b>
<b>Microsoft Terminal Services</b> <b>(<a href="#">Microsoft RDP</a>)</b>	Midmark IQpath Client for Microsoft Terminal Services, Part Number 4-100-1420.
<b>VMware VDI</b>	Midmark IQpath Client for VMware VDI, Part Number 4-100-1425.
<b>Citrix ICA</b>	Midmark IQpath Client for Citrix ICA, Part Number 4-100-1430.

The above software needs to be installed only on computers that are used for IQecg, Midmark Digital Spirometer, Midmark Digital Vital Signs Device or IQvitals Zone data acquisition.

Midmark IQpath Client for Microsoft Terminal, Midmark IQpath Client for VMware VDI, and Midmark IQpath Client for Citrix ICA will each occupy approximately 12 megabytes (MB) of disk space. This value does not include the disk space (approximately 2GB) that is required for prerequisite software such as .NET Framework 4.5.1 and Microsoft Visual C++ 2017 Redistributable (x86)/(x64) Runtime libraries. We recommend that you consult the latest Microsoft requirements for these prerequisites.

[Section III](#) describes the installation procedures for client computers.

## Server Side Application Software Requirements

The Midmark IQpath® software requires the following software to be installed on the application server.

Application Type	Requirement	
<b>Electronic Medical Record (EMR) application using the MDG ActiveX controls or IQconnect platform.</b>	IQpath	ECG and Spirometer software v. 8.0 or later.
		Vital Signs software v. 8.4.1 or later.
		VMware requires ECG and Spirometer v. 10.0.4, or Vital Signs software v. 11.0.3 or later.

Application Type	Requirement	
<b>IQmanager®</b>	IQpath	ECG and Spirometer software v. 8.0 or later.
		Vital Signs software v. 8.4.1 or later.
		VMware requires ECG and Spirometer v. 10.0.4, or Vital Signs software v. 11.0.3 or later of the plugins in IQmanager v. 10.0.0 or later.
<b>IQiC (Midmark/Centricity I/F)</b>	IQpath	ECG and Spirometer v. 4.1 or later of the IQiC Software.
		Vital Signs software v. 6.1 or later of the IQiC Software.
		VMware requires ECG and Spirometer software v. 10.0.4, or Vital Signs software v. 11.0.3 or later of the plugins in IQiC v. 10.0.0 or later.

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Application Type	Requirement	
<b>IQiA (Midmark/Allscripts Interface)</b>	IQpath	<p>ECG and Spirometer software v.1.0 or later of the IQiA software.</p> <p>Vital Signs software v. 2.0 or later of the IQiA software.</p> <p>VMware requires ECG and Spirometer software v. 10.0.4, or Vital Signs software v. 11.0.3 or later of the plugins in IQiA Version 10.0.1 or later.</p>

Application Type	Requirement	
<b>IQiE (Midmark/Epic interface)</b> For ECG and Midmark Digital Spirometer, see <b>EMR Application</b> in the list above.	IQpath	<p>Vital Signs software – All versions</p> <p>VMware requires Vital Signs software 11.0.3 or later of the plugin in IQiE v. 10.0.1 or later.</p>

Contact the manufacturer of your EMR application if unsure of which version of the interface software you are using.

## C. Minimum Network Performance Requirements

The minimum network performance requirements may vary slightly depending upon the client device, the thin client software version, and the network configuration.

### **IQpath – Minimum Network Performance Requirements**

Midmark has verified the performance of the [IQpath driver DLLs](#) in a laboratory environment using special purpose network simulation software. The lab test environment allows Midmark to simulate a variety of network conditions.

Based on simulated network conditions, Midmark has determined the minimum network performance required for continuous, real time operation of ECG. Table 3.4 presents the minimum network performance requirements when using Microsoft Terminal Services (RDP) or VMware VDI. Table 3.5 presents the minimum network performance requirements required when using Citrix ICA.

The network performance parameters shown in the tables represent average, sustained conditions. The cutoff points in the Recommended Network Performance column were determined using the following criteria.

1. The ECG scrolling in the real time ECG screen should be smooth.
2. The delay between the sampled data and the displayed data should be less than 1 second.
3. The effective ECG sample data throughput must be real time. The sample data should not back up in buffers maintained by the IQpath driver DLL.

Spirometry and vitals devices require a much lower data transfer rate than ECG so network performance is generally not a consideration.

**Table 3.4 Minimum Network Performance for Microsoft Terminal Services and VMware VDI**

Network Performance Parameter	Recommended Network Performance
<b>Latency</b>	<= 230 ms
<b>Jitter</b>	<= 200 ms

<b>Packet Loss</b>	<= 5%
<b>Bandwidth</b>	>= 128 Kbps

**Table 3.5 Minimum Network Performance for Citrix ICA**

<b>Network Performance Parameter</b>	<b>Recommended Network Performance</b>
<b>Latency</b>	<= 1000 ms
<b>Jitter</b>	<= 500 ms
<b>Packet Loss</b>	<= 5%
<b>Bandwidth</b>	>= 64 Kbps

The above tables specify the bandwidth requirements are for a single client performing an ECG acquisition session. Although the minimum bandwidth requirements exceed the bandwidth available using a dialup connection, multiple ECG sessions can operate over a DSL or T1 network connection.

Given that a client computer is connected to the network with at least a DSL connection, the network performance conditions listed in the above tables represent very poor network conditions. It is likely that almost all users with at least a DSL connection will have a reasonable user experience when using the Midmark IQpath® software.

Midmark also performed testing for network conditions that do not meet the recommended performance requirements listed above and found that under no circumstances was ECG data lost or corrupted. Even with extremely poor network conditions (say 500-1000 ms latency using Microsoft Terminal Services) it was possible to acquire an ECG report. As network performance got worse, the user experience degraded to the point where the application became unusable.

**NOTE:** Midmark obtained the above results in a laboratory environment using network simulation software. Although experience has shown that the simulated conditions accurately represent real world conditions, your experience may not exactly match the findings presented here

## III. IQpath

### A. Client Side User Settings

#### Microsoft Terminal Services (RDP)

Each client computer that will be used for IQecg, Midmark Digital Spirometer, IQvitals, or IQvitals Zone data acquisition must have IQpath for Microsoft Terminal Services installed and the appropriate registry keys must be set. The installation program for the Midmark IQpath for Microsoft Terminal Services automatically performs both of these tasks.

If more than one user login account will be used for data acquisition on the same computer, system administrators have the following two options.

1. Run the installation program for each user login account.
2. Add settings to the login script for each user of a data acquisition computer to set the appropriate registry keys.

Microsoft Terminal Services requires registry settings under HKEY\_CURRENT\_USER in order to locate and load IQpath® driver DLLs. The file called "MidmarkRdp.reg" is a registry script file that contains the necessary registry settings. This file is installed in the target directory on a client computer by the installation program. The target directory is C:\Midmark\ThinClient.

The MidmarkRdp.reg file contains the following settings.

```
[HKEY_CURRENT_USER\Software\Microsoft\Terminal Server Client\Default\AddIns\IQecg]
"Name"="C:\Midmark\ThinClient\RdpEcg.dll"
```

```
[HKEY_CURRENT_USER\Software\Microsoft\Terminal Server Client\Default\AddIns\IQspiro]
"Name"="C:\Midmark\ThinClient\RdpSpiro.dll"
```

```
[HKEY_CURRENT_USER\Software\Microsoft\Terminal Server Client\Default\AddIns\IQvitals]
"Name"="C:\Midmark\ThinClient\RdpVsm.dll"
```

```
[HKEY_CURRENT_USER\Software\Microsoft\Terminal Server Client\Default\AddIns\IQvitalsZone]
"Name"="C:\Midmark\ThinClient\RdpVZone.dll"
```

#### VMware VDI

Each client computer that will be used for IQecg, Midmark Digital Spirometer, IQvitals, or IQvitals Zone data acquisition must have IQpath for VMware installed and the appropriate registry keys must be set. The installation program for the Midmark IQpath for VMware automatically performs both of these tasks.

If more than one user login account will be used for data acquisition on the same computer, system administrators have the following two options.

1. Run the installation program for each user login account.
2. Add settings to the login script for each user of a data acquisition computer to set the appropriate registry keys.

VMware VDI requires registry settings under HKEY\_CURRENT\_USER in order to locate and load IQpath® driver DLLs. The file called "MidmarkVMwareVDI.reg" is a registry script file that contains the necessary registry settings. This file is installed in the target directory on a client computer by the installation program. The target directory is C:\Midmark\ThinClient.

The MidmarkVMwareVDI.reg file contains the following settings.

```
[HKEY_CURRENT_USER\Software\Microsoft\Terminal Server Client\Default\AddIns\IQecg]
"Name"="C:\Midmark\ThinClient\RdpEcg.dll"
"View Enabled"=dword:00000001
```

```
[HKEY_CURRENT_USER\Software\Microsoft\Terminal Server Client\Default\AddIns\IQspiro]
"Name"="C:\Midmark\ThinClient\RdpSpiro.dll"
"View Enabled"=dword:00000001
```

```
[HKEY_CURRENT_USER\Software\Microsoft\Terminal Server Client\Default\AddIns\IQvitals]
"Name"="C:\Midmark\ThinClient\RdpVsm.dll"
"View Enabled"=dword:00000001
```

```
[HKEY_CURRENT_USER\Software\Microsoft\Terminal Server Client\Default\AddIns\IQvitalsZone]
"Name"="C:\Midmark\ThinClient\RdpVZone.dll"
"View Enabled"=dword:00000001
```

## Citrix ICA

When using Citrix ICA, each client computer that will be used for IQecg, Midmark Digital Spirometer, IQvitals, or IQvitals Zone data acquisition must have the Midmark IQpath for Citrix ICA installed and the Citrix configuration settings in the registry must be modified. The installation program for the Midmark IQpath for Citrix ICA automatically performs both of these tasks. There are no settings required for individual user login accounts.

The installation program automatically edits the registry settings located under [HKEY\_LOCAL\_MACHINE\SOFTWARE\Citrix\ICA Client\Engine\Configuration\Advanced\Modules]

The file called "MidmarkCtx.reg" is a registry script file that contains the necessary registry settings for 32 bit Operating Systems. For 64 bit

Operating Systems, the registry script file is "MidmarkCtx\_64bit.reg". These files are installed on C:\Midmark\ThinClient.

The MidmarkCtx.reg file contains the following settings.

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Citrix\ICA Client\Engine\Configuration\Advanced\Modules\IQecg]
"DriverName"="CtxEcg.dll"
"DriverNameWin32"="CtxEcg.dll"
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Citrix\ICA Client\Engine\Configuration\Advanced\Modules\IQspiro]
"DriverName"="CtxSpiro.dll"
"DriverNameWin32"="CtxSpir.dll"
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Citrix\ICA Client\Engine\Configuration\Advanced\Modules\IQvitals]
"DriverName"="CtxVsm.dll"
"DriverNameWin32"="CtxVsm.dll"
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Citrix\ICA Client\Engine\Configuration\Advanced\Modules\IQvitalsZone]
"DriverName"="CtxVZone.dll"
"DriverNameWin32"="CtxVZone.dll"
```

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Citrix\ICA Client\Engine\Configuration\Advanced\Modules\ICA 3.0]
"VirtualDriverEx"="IQecg, IQspiro, IQvitals, IQvitalsZone"
```

If the software is installed on a 64-bit machine, replace the preceding

[HKEY\_LOCAL\_MACHINE\SOFTWARE] with [HKEY\_LOCAL\_MACHINE\SOFTWARE\Wow6432Node].

## B. Server Side Application Settings

By default, the Midmark v.10.0.0 software uses the Citrix virtual channel when running in a thin client environment. IQecg® (v. 10.0.4), Midmark Digital Spirometer (10.0.4), IQvitals® (11.0.3), IQvitals® Zone™ (11.0.3), and higher do not need to be configured to use virtual channels, the software will auto detect the virtual channel being used.

The manner in which you change application configuration settings depends upon the application you are using. The Midmark IQmanager and some EMR applications provide access to the settings in the software or a separate configuration utility that allows configuration of the IQecg, Midmark Digital Spirometer, IQvitals, and IQvitals Zone. If you are running an application that provides a configuration utility, then run that utility and change the IQecg, Midmark Digital Spirometer, IQvitals, and IQvitals Zone configuration settings as described in the following subsections.

If you are running an application that has no configuration utility or external method to change the settings, it will be necessary to start an IQecg, Midmark Digital Spirometer, IQvitals, and/or IQvitals Zone procedure for a selected patient and change the configuration settings from the acquisition screen. When you initiate the acquisition session, the



software will automatically attempt to connect to the device using Citrix virtual channel. If the device is not connected, the software may display the Auto-Detect dialog box and begin searching for it. If this happens, click on the Cancel button of the Auto-Detect dialog, then click on the Settings button or tab. Follow the procedures in the following subsections to select the type of thin client environment you are using.

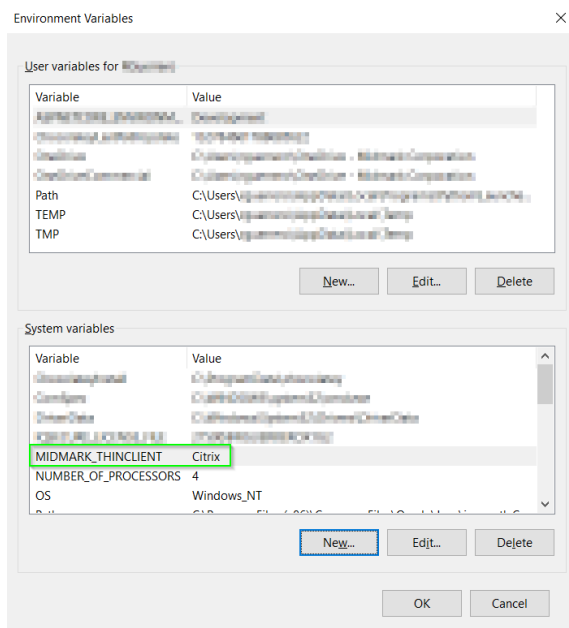
Please refer to the software or device operation manual for the appropriate steps to set the IQpath settings.

### Citrix Virtual Apps and Desktops 7 2206

This Citrix version blocks custom virtual channels by default. All Midmark virtual channels are custom and must be enabled by adding these channel items if you are using this version.

Create an environment variable for Citrix, RDP, or VMware depending on the server (or VM computer).

MIDMARK\_THINCLIENT=<type>



If the environment variable is not created, a Windows Registry item must be created and set to Citrix, RDP, or VMware.

32-bit Windows:

[HKEY\_LOCAL\_MACHINE\\Software\\Midmark\\ThinClient]

"ThinClientType" = <type>

64-bit Windows:

[HKEY\_LOCAL\_MACHINE\\Software\\WOW6432Node\\Midmark\\ThinClient]

"ThinClientType" = <type>

Then use Citrix Studio on the Citrix Server to set up the virtual channel policy and include the Midmark custom channel items to virtual channel ALLOW LIST. Depending on your organization settings, the clients will need to wait until the policy is updated before the changes are applied.

### Virtual channel allow list



Each row on the Allow List represents a custom virtual channel. The first item is the virtual channel name. The second is the path to the executable program which calls the module where the named virtual channel is opened and connected to the client computer. The Allow List accepts only all upper-case channel name. But the program code can use any case for the channel name.

## **C. Dual Installs**

It is possible to install both the Midmark IQpath for Microsoft Terminal Services or VMware and the Midmark IQpath for Citrix ICA on the same client computer. However, users should not attempt to run a Microsoft Terminal Services or VMware VDI remote session and a Citrix ICA remote session at the same time.

IQpath for Microsoft Terminal Services, IQpath for Citrix, and IQpath for VMware should not be installed on the same computer.

## **D. Simultaneous Remote Sessions**

It is possible to run two thin client sessions on the same client computer. If you run multiple sessions of Microsoft Terminal Services, multiple sessions of VMware VDI, or multiple sessions using Citrix ICA, then only the first session on the client machine will be able to connect to the IQecg, Midmark Digital Spirometer, IQvitals, or IQvitals Zone™ devices.

Please note that IQpath does not support a double hop where a user launches into one thin client session and then, from there, launches a second thin client session. Client Software Installation OptionsMidmark provides separate installations for Microsoft Terminal Services, VMware VDI, and Citrix ICA. Use the appropriate installation files for the desired IQpath version.

## **Silent Installation**

The silent installation command is as follows and should be run from the directory containing the setup file.

```
Setup /s /v"/qn ACCEPT_EULA=Yes"
```

## Silent Uninstallation

The silent uninstallation command is as follows and should be run from the directory containing the setup file.

```
Msiexec /x {[Product ID]} /qn
```

Replace *[Product ID]* with the product ID of the installer. For example, the product id for IQpath RDP v.3.0.0 is {9B740040-AD5C-463E-B186-D7DB60E82E78}. The installation command is as follows:

```
Msiexec /x {9B740040-AD5C-463E-B186-D7DB60E82E78} /qn
```

IQpath Citrix v3.0.0 is {82F7C065-3A7E-48F0-8F92-6E2D90E702AB}

## IV. Recommendations for Holter

If you are using v. 8.6.1 the Holter security key (dongle) should be installed on the local computer along with the SD card reader. This version does not support thin client setups.

As of Midmark v.10.0.0, the Holter software implements a software based license and no longer requires a hardware security key (dongle) on the server.

To scan a Holter report from a CompactFlash or SD card, the card reader can be installed on the server computer or on a client computer. If the card reader is installed on a client computer, the drive needs to be mapped to the server, so the software installed on the server can locate the card reader.

For more information, see your Midmark Holter product's manual.

**NOTE:** The Midmark IQholter software does not use IQpath to operate in a thin client environment. IQholter software is not a real-time application and does not require the same network bandwidth or system resources as the ECG, Spirometry, and Vitals products. However, expect some delays for larger 48-72 hour Holter studies.

## V. Appendix A. IQpath Troubleshooting Guide

This section provides guidelines for troubleshooting issues that may be encountered using the IQecg, Midmark Digital Spirometer, IQvitals, and IQvitals Zone™ IQpath software. Table 5.1 presents a troubleshooting guide for ECG, Table 5.2 presents a troubleshooting guide for Spirometry, and Table 5.3 presents a troubleshooting guide for Vitals.

**Table 5.1 ECG IQpath® Troubleshooting Guide**

<b>ECG IQpath® Troubleshooting Guide</b>	
<b>Error Message or Problem</b>	<b>Solution or Recommendation</b>
<p>A pop up dialog with the following message appears:</p> <p><b>Error writing to Midmark RDP ECG for IQpath.</b></p>	<p>The ECG software running on the terminal server computer was not able to write to the RDP IQpath driver DLL on the client computer.</p> <p>One possible cause for this problem may be that the IQpath driver DLLs have not been installed on the client computer. Install the Midmark IQpath for Microsoft Terminal Services on the client computer and try again.</p> <p>Another possible cause is that registry keys for the current user have not been set. Terminate the thin client session and run the MidmarkRdp.reg file located in the C:\Midmark\ThinClient directory on the client computer.</p>
<p>A pop up dialog with the following message appears:</p> <p><b>Error writing to Midmark Citrix for IQpath.</b></p>	<p>The ECG software running on the terminal server computer was not able to write to the Citrix IQpath driver DLL on the client computer.</p> <p>One possible cause for this problem is that the IQpath driver DLLs have not been installed on the client computer. Install the IQpath for Citrix ICA on the client computer and try again.</p> <p>Another possible cause is that the Citrix configuration settings for the drivers are not configured properly by the installation program. Locate the</p>

ECG IQpath® Troubleshooting Guide	
Error Message or Problem	Solution or Recommendation
	MidmarkCtx.reg (for 32 bit), or MidmarkCtx_64bit.reg (for 64 bit) files on C:\Midmark\ThinClient directory on the client computer.
<p>A pop up dialog with the following message appears:</p> <p><b>Error open to Midmark VDI ECG for IQpath.</b></p>	<p>The ECG software running on the server computer was not able to write to the VMware IQpath driver DLL on the client computer.</p> <p>One possible cause for this problem may be that the IQpath driver DLLs have not been installed on the client computer. Install the Midmark IQpath for VMware on the client computer and try again.</p> <p>Another possible cause is that registry keys for the current user have not been set. Terminate the thin client session and run the MidmarkVMwareVDI.reg file located in the C:\Midmark\ThinClient directory on the client computer.</p>
<p>A message box in the top right indicating <b>“USB Device is disconnected”</b> appears.</p>	<p>This message appears if the IQpath driver on the client machine (RDP or Citrix) was not able to communicate with the ECG module. The message indicates the possible causes of the problem.</p> <p>Connect the ECG module to a USB port or different USB port on the client computer.</p> <p>If the Midmark log shows the software is looking for a local device and not a device connected over thin client, override the auto detection by choosing Option 1 or 2 below:</p> <ol style="list-style-type: none"> <li>1. Add environment variable MIDMARK_THINCLIENT=&lt;type&gt;</li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>2. Add registry Key HKEY_LOCAL_MACHINE/Software/Mid</li> </ol>

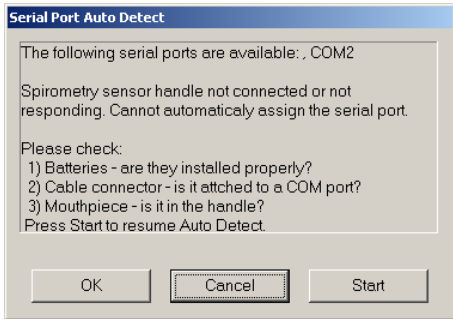
ECG IQpath® Troubleshooting Guide	
Error Message or Problem	Solution or Recommendation
	<p>mark/ThinClient/ThinClientType=&lt;type&gt;</p> <p>Where &lt;type&gt; is of the following: "citrix", "rdp", or "vmware"</p> <p>Note: This is done on the server with the Midmark controls.</p>
<p><b>"Network Delays"</b> appears in the upper right hand side of the ECG screen.</p>	<p>This indication appears when the ECG waveforms displayed on the screen are delayed by 2 seconds or more. This condition can arise when the network performance fails to meet the minimum performance requirements specified in Section II-C for an extended period.</p> <p>This indication will disappear if network conditions improve. If network conditions do not improve, then eventually the ECG display will stop and the "ECG Stopped" indication described below will appear.</p> <p>You can continue with the ECG session and acquire an ECG report. The ECG software will continue to run for approximately 15 minutes or more depending upon network conditions.</p>
<p><b>"ECG Stopped"</b> appears in the upper right hand side of the ECG screen.</p>	<p>When network conditions are so poor that the ECG IQpath driver on the client computer cannot keep up real time ECG data transfer, it will stop sampling ECG when its buffers are exhausted.</p> <p>When this occurs, you can exit the ECG screen by clicking on the Exit button and restart a new ECG session.</p>

Table 5.2 Spirometry IQpath® Troubleshooting Guide

Spirometry IQpath® Troubleshooting Guide	
Error Message or Problem	Solution or Recommendation
<p>A pop up dialog with the following message appears:</p> <p><b>Error: Unable to open the MDG RDP Spirometry virtual channel.</b></p>	<p>This error message indicates that the Spirometry software could not load the server side virtual channel DLL called WtsApi32.dll. This is a Microsoft Windows DLL that is installed when Terminal Services is installed.</p> <p>Verify that Terminal Services is installed and properly configured in the terminal server.</p>
<p>A pop up dialog with the following message appears:</p> <p><b>Error: Unable to open the MDG Citrix Spirometry virtual channel.</b></p>	<p>This error message indicates that the Spirometry software could not load the Citrix server side virtual channel DLL called WfApi.dll. This is a Citrix DLL that is installed when the Citrix Presentation Manager is installed on the terminal server.</p> <p>Install the Citrix terminal server on the terminal server computer.</p>
<p>A pop up dialog with the following message appears:</p> <p><b>Error: Unable to open to the Midmark VMware Spirometry virtual channel.</b></p>	<p>This error message indicates that the Spirometry software could not load the server side virtual channel DLL called WtsApi32.dll. This is a Microsoft Windows DLL that is installed when Terminal Services is installed.</p> <p>Verify that Terminal Services is installed and properly configured in the terminal server.</p> <p>This error message may also indicate that the Spirometry software could not load the server side VMware virtual channel DLL called vdp_rdpvcbridge.dll. This is a VMware View RDP VC Bridge Library that is installed by VMware Horizon View Agent.</p> <p>Verify that the correct version of the VMWare Horizon View Agent v7.3.1 or above is installed.</p>



Vitals IQpath® Troubleshooting Guide	
Error Message or Problem	Solution or Recommendation
<p>A pop up dialog with the following message appears:</p> <p><b>Error: Unable to write to the MDG RDP Spirometry virtual channel.</b></p>	<p>The Spirometry software running on the terminal server computer was not able to write to the RDP IQpath driver DLL on the client computer.</p> <p>One possible cause for this problem may be that the IQpath driver DLLs have not been installed on the client computer. Install the Midmark IQpath® for Microsoft Terminal Services on the client computer and try again.</p> <p>Another possible cause is that registry keys for the current user have not been set. Terminate the thin client session and run the MidmarkRdp.reg file located in the C:\Midmark\ThinClient directory.</p>
<p>A pop up dialog with the following message appears:</p> <p><b>Error: Unable to write to the MDG Citrix Spirometry virtual channel.</b></p>	<p>The Spirometry software running on the terminal server computer was not able to write to the Citrix IQpath® driver DLL on the client computer.</p> <p>One possible cause for this problem is that the IQpath driver DLLs have not been installed on the client computer. Install the Midmark IQpath for Citrix ICA on the client computer and try again.</p> <p>Another possible cause is that the Citrix configuration settings for the drivers are not configured properly by the installation program. Locate the MidmarkCtx.reg (for 32 bit), or MidmarkCtx_64bit.reg (for 64 bit) files on the C:\Midmark\ThinClient directory on the client computer.</p>

Vitals IQpath® Troubleshooting Guide	
Error Message or Problem	Solution or Recommendation
<p>A pop up dialog with the following message appears:</p> <p><b>Error: Unable to write to the Midmark VMware Spirometry virtual channel.</b></p>	<p>The Spirometry software running on the server computer was not able to write to the VMware IQpath driver DLL on the client computer.</p> <p>One possible cause for this problem may be that the IQpath driver DLLs have not been installed on the client computer. Install the Midmark IQpath® for VMware on the client computer and try again.</p> <p>Another possible cause is that registry keys for the current user have not been set. Terminate the thin client session and run the MidmarkVMwareVDI.reg file located in the C:\Midmark\ThinClient directory.</p>
<p>The following dialog box appears.</p> 	<p>This is the auto-detection dialog box used for automatically detecting the Spirometry module when running as a fat-client or when using COM port mapping in a thin client environment.</p> <p>If this dialog box appears, then the Spirometry software did not detect it is being run in a thin client environment.</p> <p>To override the auto detection, choose Option 1 or 2 below:</p> <ol style="list-style-type: none"> <li>1. Add environment variable MIDMARK_THINCLIENT=&lt;type&gt;</li> </ol> <p><b>OR</b></p> <ol style="list-style-type: none"> <li>2. Add registry Key HKEY_LOCAL_MACHINE/Software/Midmark/ThinClient/ThinClientType=&lt;type&gt;</li> </ol> <p>Where &lt;type&gt; is of the following: "citrix", "rdp", or "vmware"</p>

Vitals IQpath® Troubleshooting Guide	
Error Message or Problem	Solution or Recommendation
	Note: This is done on the server with the Midmark controls.

Table 5.3 Vitals IQpath® Troubleshooting Guide

Vitals IQpath® Troubleshooting Guide	
Error Message or Problem	Solution or Recommendation
<p>A pop up dialog with the following message appears:</p> <p><b>Error open to Midmark VMware VDI IQvitals for IQpath.</b></p>	<p>The Vitals software running on the server computer was not able to write to the VMware IQpath driver DLL on the client computer.</p> <p>One possible cause for this problem may be that the IQpath driver DLLs have not been installed on the client computer. Install the Midmark IQpath for VMware on the client computer and try again.</p> <p>Another possible cause is that registry keys for the current user have not been set. Terminate the thin client session and run the MidmarkVMwareVDI.reg file located in the C:\Midmark\ThinClient directory on the client computer.</p>

## VI. Appendix B. References

1. Microsoft, *Net Use*, [http://technet.microsoft.com/en-us/library/gg651155\(Ws.10\).aspx](http://technet.microsoft.com/en-us/library/gg651155(Ws.10).aspx)

## VII. Contact Information

Technical Service is available Monday through Friday (except holidays), 6:00 am to 4:00 pm Pacific Standard Time.

Midmark Corporation  
1001 Asbury Drive  
Buffalo Grove, IL 60089 USA  
Email: [techsupport@midmark.com](mailto:techsupport@midmark.com)  
T: 844.856.1230, option 2  
Fax: 310.516.6517  
[midmark.com](http://midmark.com)

**Midmark Corporation**

1001 Asbury Drive

Buffalo Grove, IL 60089 USA

T: 844.856.1230, option 2

Fax: 310.516.6517

