

SETUP MANUAL

***Midmark Products over Thin Client using
IQpath[®] or COM port mapping
Version 3.0***



Notice

The information in this operation manual is subject to change without notice.

Midmark shall not be liable for technical or editorial omissions made herein, nor for incidental or consequential damages resulting from the furnishing, performance or use of information in this operation manual.

This document contains proprietary information protected by copyright. No part of this document may be photocopied or reproduced in any form without prior written consent from Midmark Corporation.

IQecg, IQholter, IQpath, IQvitals, IQmanager, IQspiro, and Zone are trademarks of Midmark Corporation.

Windows and Microsoft are registered trademarks of Microsoft Corporation in the United States and other countries.

Citrix, ICA, Receiver and XenApp are trademarks of Citrix Systems, Inc. and/or one or more of its subsidiaries, and may be registered in the United States Patent and Trademark Office and in other countries.

Table of Contents

RELATED DOCUMENTS:	1
I. INTRODUCTION	2
A. CAUTIONARY NOTE	2
II. REQUIREMENTS	4
A. SYSTEM REQUIREMENTS	4
B. SOFTWARE REQUIREMENTS	5
Client Computer Software Requirements	5
Server Side Application Software Requirements	6
C. MINIMUM NETWORK PERFORMANCE REQUIREMENTS	10
COM Port Mapping – Minimum Network Performance Requirements	10
IQpath® – Minimum Network Performance Requirements	10
III. IQPATH®	12
A. CLIENT SIDE USER SETTINGS	12
Microsoft Terminal Services (RDP)	12
Citrix ICA	13
B. SERVER SIDE APPLICATION SETTINGS	14
C. DUAL INSTALLS	15
D. SIMULTANEOUS REMOTE SESSIONS	15
E. CLIENT SOFTWARE INSTALLATION OPTIONS	15
Silent Installation	15
Silent Uninstallation	16
IV. COM PORT REDIRECTION (MAPPING)	16
A. CITRIX	16
B. MICROSOFT REMOTE DESKTOP CONNECTION	17
C. COM PORT SETTINGS ON CLIENT COMPUTERS	18
V. RECOMMENDATIONS FOR HOLTER	19
VI. APPENDIX A. IQPATH® TROUBLESHOOTING GUIDE	21
VII. APPENDIX B. REFERENCES	28
VIII. CONTACT INFORMATION	29

Related Documents:

- *Midmark IQecg® Operation Manual*
(Part Number: 48-78-0002)
- *Midmark IQspiro® Operation Manual*
(Part Number: 3-100-1120)
- *Midmark IQholter®, EX, EP Operation Manual*
(Part Number: 39-78-0001)
- *Midmark IQvitals® Operation Manual*
(Part Number: 21-78-0001)
- *Midmark IQvitals® PC Operation Manual*
(Part Number: 3-100-1059)
- *IQmanager® Software Operation Manual*
(Part number: 62-78-0001)


All documents referenced above are located on the Midmark Operation Manuals CD (part number: 3-100-2000), included with every device. All product Operation Manuals can also be downloaded from midmark.com. For additional information contact Midmark Support Services at 1-800-624-8950.

I. Introduction

The Midmark IQecg®, IQspiro®, IQvitals®, 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®, IQspiro®, IQvitals®, 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® or COM port mapping 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®, IQspiro®, IQvitals® and IQvitals® Zone™ devices. See [Section V, Recommendations for Holter](#).

A. Cautionary Note

Midmark has tested the IQecg®, IQspiro®, IQvitals®, 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®, IQspiro®, IQvitals®, 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"> Windows Server 2012 (Standard / Enterprise Edition) <i>Service Packs or hot-fixes may be needed</i> Windows Server 2008 (Standard / Enterprise Edition) <i>Service Packs or hot-fixes may be needed</i> Windows Server 2003 (Standard / Enterprise Edition) <i>Service Packs or hot-fixes may be needed</i> 	
2. Server Services / Software	
<ul style="list-style-type: none"> Windows Terminal Services VMware VDI Citrix XenApp Enterprise or Citrix MetaFrame Servers, Presentation Manager 4.0 or compatible. <i>(Citrix Server is required on non-Windows servers)</i> 	
3. Client	
<ul style="list-style-type: none"> 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) COM port or USB port 	
<ul style="list-style-type: none"> Windows® 10, Professional and Enterprise, 32-bit and 64-bit Windows® 8, Professional and Enterprise, 32-bit and 64-bit Windows® 7, Professional and Enterprise, 32-bit and 64-bit Windows® 7 and 2009 Embedded 	
<ul style="list-style-type: none"> Microsoft Remote Desktop Connection, Citrix Receiver Version 13.0 or compatible VMware Horizon® 7.3.1 (using Blast or PCoIP) 	
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"> IQecg® <ul style="list-style-type: none"> Real-time Data Acquisition – See Section II-C. Report Review – no requirements 	
<ul style="list-style-type: none"> IQspiro® <ul style="list-style-type: none"> Real-time Data Acquisition – See Section II-C. Report Review – no requirements 	
<ul style="list-style-type: none"> IQvitals® and IQvitals® Zone™ <ul style="list-style-type: none"> Real-time Data Acquisition – See Section II-C. Record Review – no requirements 	
<ul style="list-style-type: none"> IQholter® <ul style="list-style-type: none"> IQholter® Data Acquisition– no requirements Record Review – no requirements 	

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

Table 3-1 Minimum System Requirements

B. Software Requirements

 **NOTE:** COM port mapping does not require any client computer software.

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®, IQspiro®, IQvitals® or IQvitals® Zone™ data acquisition.

Thin Client Type	Client Software Required
Microsoft Terminal Services (Microsoft RDP)	Midmark IQpath® Client for Microsoft Terminal Services, Part Number 4-100-1420.
VMware VDI	Midmark IQpath® Client for VMware VDI, Part Number 4-100-1425.
Citrix ICA	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®, IQspiro®, IQvitals® 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 and COM port mapping configuration requires the following software to be installed on the application server.

Application Type	Requirement	
<p>Electronic Medical Record (EMR) application using the MDG ActiveX controls or IQconnect platform.</p>	IQpath®	<p>IQecg® and IQspiro® – Version 8.0 or later of the MDG ActiveX controls.</p> <p>IQvitals® – Version 8.4.1 or later of the MDG ActiveX controls.</p> <p>IQvitals® Zone™ – Version 11.0.2 or later of the Vitals plugin on the IQconnect platform.</p> <p>VMware requires IQecg® 10.0.4, IQspiro® 10.0.4, or IQvitals® 11.0.3 or later of the plugins on the IQconnect platform.</p>
	COM port mapping	<p>IQecg® and IQspiro® – Version 4.0 or later of the MDG ActiveX controls.</p> <p>IQvitals® – Version 8.4.1 or later of the MDG ActiveX controls.</p> <p>IQecg® no longer supports COM port mapping as v. 10.0.0</p>

Midmark Products over Thin Client using IQpath® or COM port mapping

<p>IQmanager®</p>	<p>IQpath®</p>	<p>IQecg® and IQspiro® – Version 8.0 or later of the IQmanager® software.</p> <p>IQvitals® –Version 8.4.1 or later of the IQmanager® software.</p> <p>IQvitals® Zone™ – Version 11.0.2 or later of the Vitals plugin in IQmanager Version 10.0.0 or later.</p> <p>VMware requires IQecg® 10.0.4, IQspiro® 10.0.4, or IQvitals® 11.0.3 or later of the plugins in IQmanager Version 10.0.0 or later.</p>
	<p>COM port mapping</p>	<p>IQecg® and IQspiro® – Version 4.0 or later of the IQmanager® software.</p> <p>IQvitals® – Version 8.4.1 or later of the IQmanager® software.</p> <p>IQecg® no longer supports COM port mapping as v. 10.0.0</p>
<p>IQiC (Midmark/Centricity I/F)</p>	<p>IQpath®</p>	<p>IQecg® and IQspiro®- Version 4.1 or later of the IQiC software.</p> <p>IQvitals® – Version 6.1 or later of the IQiC software.</p> <p>IQvitals® Zone™ – Version 11.0.2 or later of the Vitals plugin in IQiC Version 10.0.0 or later.</p> <p>VMware requires IQecg® 10.0.4, IQspiro® 10.0.4, or IQvitals® 11.0.3 or later of the plugins in IQiC Version 10.0.0 or later.</p>

Midmark Products over Thin Client using IQpath® or COM port mapping

	COM port mapping	<p>IQecg® and IQspiro®- Version 2.0 or later of the IQiC software.</p> <p>IQvitals® – Version 6.1 or later of the IQiC software.</p> <p>IQecg® no longer supports COM port mapping as v. 10.0.0</p>
<p>IQiA (Midmark/Allscripts Interface)</p>	IQpath®	<p>IQecg® and IQspiro®– Version 1.0 or later of the IQiA software.</p> <p>IQvitals® – Version 2.0 or later of the IQiA software.</p> <p>IQvitals® Zone™ – Version 11.0.2 or later of the Vitals plugin in IQiA Version 10.0.1 or later.</p> <p>VMware requires IQecg® 10.0.4, IQspiro® 10.0.4, or IQvitals® 11.0.3 or later of the plugins in IQiA Version 10.0.1 or later.</p>
	COM port mapping	<p>IQecg® and IQspiro®– Version 1.0 or later of the IQiA software.</p> <p>IQvitals®– Version 2.0 or later of the IQiA software.</p> <p>IQecg® no longer supports COM port mapping as v. 10.0.0</p>

Midmark Products over Thin Client using IQpath® or COM port mapping

IQiE (Midmark/Epic interface) For ECG and Spiro, see EMR Application in the list above	IQpath®	IQvitals® – All versions IQvitals® Zone™ – Version 11.0.2 or later of the Vitals plugin in IQiE Version 10.0.1 or later. VMware requires IQvitals® 11.0.3 or later of the plugin in IQiE Version 10.0.1 or later.
	COM port mapping	IQvitals® – All versions

Contact the manufacturer of your EMR application if unsure of which version of the Midmark IQecg®, IQspiro®, IQvitals® and IQvitals® Zone™ 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.

COM Port Mapping – Minimum Network Performance Requirements

Network Performance Parameter	Recommended Network Performance
Latency	<= 25 ms
Jitter	<= 35 ms
Packet Loss	< 1%
Bandwidth	>= 256Kbps

Table 3-2 Minimum Network Performance (Windows Running as a Thin Client)

Network Performance Parameter	Recommended Network Performance
Latency	<= 16 ms
Jitter	<= 10 ms
Packet Loss	<= 0.1%
Bandwidth	>= 300Kbps

Table 3-3 Minimum Network Performance (Thin Client Device)

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
Latency	<= 230 ms
Jitter	<= 200 ms
Packet Loss	<= 5%
Bandwidth	>= 128 Kbps


Table 3.5 Minimum Network Performance for Citrix ICA

Network Performance Parameter	Recommended Network Performance
Latency	<= 1000 ms
Jitter	<= 500 ms
Packet Loss	<= 5%
Bandwidth	>= 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®, IQspiro®, 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®, IQspiro®, 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®, IQspiro®, 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, IQvitalZone"
```

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 (versions before 10.0.0 use COM port mapping as the default). IQecg® (v. 10.0.4), IQspiro® (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®, IQspiro®, IQvitals®, and IQvitals® Zone™. If you are running an application that provides a configuration utility, then run that utility and change the IQecg®, IQspiro®, 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®, IQspiro®, 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.

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 VMware, 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®, IQspiro®, IQvitals®, or IQvitals® Zone™ devices.

E. Client Software Installation Options

Midmark 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. COM Port Redirection (Mapping)

The IQspiro® and IQvitals® devices can be run in thin client with IQpath® or COM port mapping. COM port mapping has stricter network requirements, but can be run with more operating systems due to lack of client side software requirements. The COM port mapping solution requires that the client computer has an available serial port to connect the device. For those clients that do not have serial ports, a USB-to-serial adapter can be used to emulate a serial port on a PC, in which case clients should be using an approved OS that meets the USB-to-serial adapters requirements and Midmark's operating system requirements. Setting up COM port mapping varies slightly for RDP or Citrix environments see detailed information below.

A. Citrix

In a Citrix thin client environment, a user can redirect the client's COM1 port to the server's COM2 port by using this command: **net use COM2: \\client\COM1:**

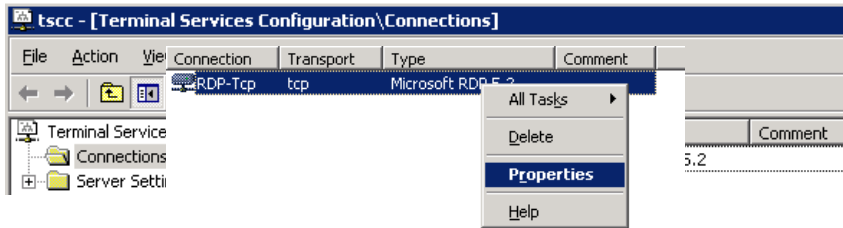
In the above example, the IQspiro® and IQvitals® module connected to the COM1 port of the client computer will appear as if it is connected to the COM2 port on the server.

To do this, create a thin client session on the client machine. From the desktop of the server (as viewed from the thin client session window), launch a command prompt window and execute the above command. This needs to be performed only once for each client machine, as long as the connections are set to be remembered Refer to link listed in [Appendix B. References, Net Use](#). You can also add the above command to the logon script for the thin client's logon script.

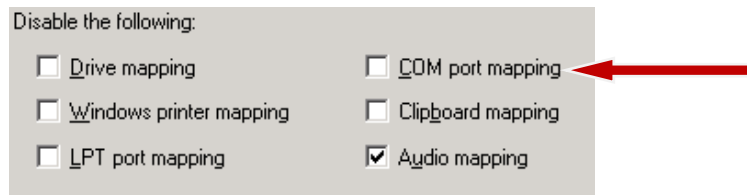
B. Microsoft Remote Desktop Connection

To use a Microsoft Remote Desktop Connection (RDP), the user must turn on the *Serial Ports* option on the *Local Resources* tab before making the connection to the Windows Server.

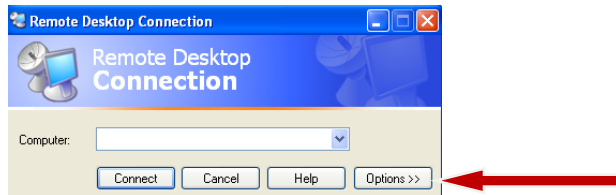
1. To open Microsoft Remote Connection, go to *Administrative Tools* and select *Terminal Services Configuration*, on the server.



2. Right-click *RDP-tcp* and then select *Properties*.
3. You need to make sure that the *COM Port Mapping* box is **NOT** checked.



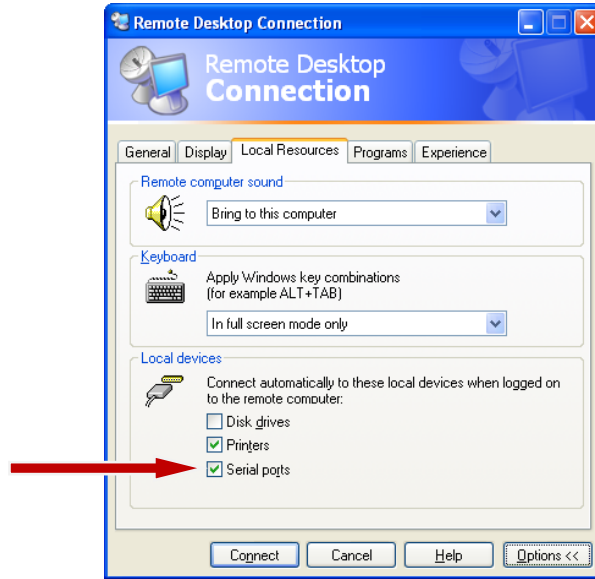
4. From the client computer, open the *RDP* connection and click **Options**.



5. Click on the *Local Resources* tab.



6. Ensure that the *Serial ports* box is checked.



To prevent the Midmark software from scanning all available ports when connecting from different computers, Midmark recommends standardizing on the COM port used on the server.

NOTE: The COM port number that is used by the software is stored in the Spiroconfig.cfg file or VSMconfig.cfg file according to the type of device used, see Section III-B. The software will first look at the designated COM port and if the device is not on that COM port (because one computer used COM 2 and another is using COM 3) it will scan all ports until it finds the Midmark device. By using the same COM port, the rescanning process does not need to run.

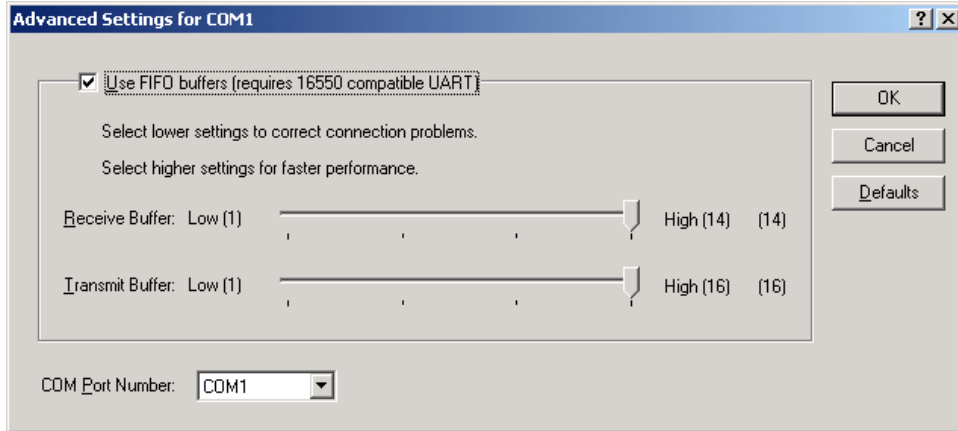
When using Citrix, for instance, this means the script to map the serial ports would always map COM 1 on the client machine to COM 5 (just used as an example, the actual COM port number will be up to the IT personnel).

When using RDP, for instance, this means the local serial port would be set to COM 5 on the client and map to COM 5 on the server (just used as an example, the actual COM port number will be up to the IT personnel). The RDP software, by default, will map the same client port number to the same port number on the server.

C. COM Port Settings on Client Computers

Changing the COM port settings on client computers may improve the network bandwidth utilization. The following procedure is based on Windows XP, though it is similar on other operating systems.

1. **Start** → **Settings** → **Control Panel** → **System** → *Hardware* tab → **Device Manager**
2. Expand *Ports (COM & LPT)* → choose the port that connects to the ECG module
3. Right-click → *Properties* → *Port Settings* tab → **Advanced**
4. The settings should be set as follows:



5. Click **OK**, even if no changes were made.
6. Click **OK** to close each open window. DO NOT use **X** or **Cancel**.
7. Reboot the client computer.

Midmark has observed a 30 - 40% reduction in bandwidth requirements by implementing the above configuration changes in a test environment.

NOTE: If the end-user experiences loss of data (the software automatically reports this when it occurs), try to change the *Receive Buffer* setting to a lower number until the problem is resolved.

Since network configurations vary from one site to another, Midmark highly recommends implementing and validating in a real world environment before deployment in a production environment.


V. Recommendations for Holter

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.

The Holter security key (dongle) should be installed on the server. 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.

Midmark Products over Thin Client using IQpath® or COM port mapping

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

 **NOTE:** The Midmark IQholter® software does not use IQpath® or COM port mapping 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.

VI. Appendix A. IQpath® Troubleshooting Guide

This section provides guidelines for troubleshooting issues that may be encountered using the IQecg®, IQspiro®, 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

ECG IQpath® Troubleshooting Guide	
Error Message or Problem	Solution or Recommendation
<p>A pop up dialog with the following message appears:</p> <p>Error writing to Midmark RDP ECG for IQpath.</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>Error writing to Midmark Citrix for IQpath.</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 MidmarkCtx.reg (for 32 bit), or MidmarkCtx_64bit.reg (for 64 bit) files on C:\Midmark\ThinClient directory on the client computer.</p>

ECG IQpath® Troubleshooting Guide	
Error Message or Problem	Solution or Recommendation
<p>A pop up dialog with the following message appears:</p> <p>Error open to Midmark VDI ECG for IQpath.</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 “USB Device is disconnected” 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"> 1. Add environment variable MIDMARK_THINCLIENT=<type> <p>OR</p> <ol style="list-style-type: none"> 2. Add registry Key HKEY_LOCAL_MACHINE/Software/Midmark/ThinClient/ThinClientType=<type> <p>Where <type> is of the following: “citrix”, “rdp”, or “vmware”</p> <p>Note: This is done on the server with the Midmark controls.</p>

ECG IQpath® Troubleshooting Guide	
Error Message or Problem	Solution or Recommendation
<p>“Network Delays” 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>“ECG Stopped” 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>Error: Unable to open the MDG RDP Spirometry virtual channel.</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>Error: Unable to open the MDG Citrix Spirometry virtual channel.</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>Error: Unable to open to the Midmark VMware Spirometry virtual channel.</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>

<p>A pop up dialog with the following message appears:</p> <p>Error: Unable to write to the MDG RDP Spirometry virtual channel.</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>Error: Unable to write to the MDG Citrix Spirometry virtual channel.</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>

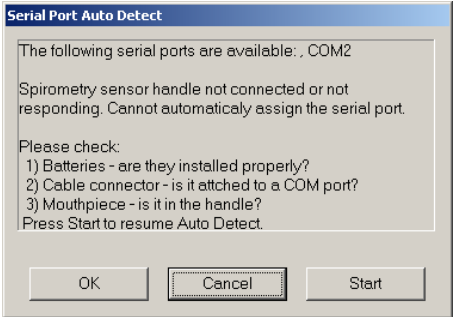
<p>A pop up dialog with the following message appears:</p> <p>Error: Unable to write to the Midmark VMware Spirometry virtual channel.</p>	<p>The Spirometry software running on the server computer was not able to write to the VMware IQpath® driver DLL on the client computer.</p> <p>One possible cause 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"> 1. Add environment variable MIDMARK_THINCLIENT=<type> <p>OR</p> <ol style="list-style-type: none"> 2. Add registry Key HKEY_LOCAL_MACHINE/Software/Midmark/ThinClient/ThinClientType=<type> <p>Where <type> is of the following: "citrix", "rdp", or "vmware"</p> <p>Note: This is done on the server with the Midmark controls.</p>

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>Error open to Midmark VMware VDI IQvitals for IQpath.</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>

VII. 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)

VIII. Contact Information

Midmark Corporation
690 Knox Street, Suite 100
Torrance, California 90502
Phone: (310) 516-6050
USA: (800) 624-8950
Fax: (310) 516-6517
Email: techsupport@midmark.com
Website: midmark.com
Knowledge Base: kb.midmark.com

