Molecular Devices High-Content Screening

MetaXpress Software
MetaXpress PowerCore Software
MDCStore Data Manager
AcuityXpress Software

Computer and Server Requirements for Offline Analysis

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MOLECULAR DEVICES

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Contents

Chapter 1: Introduction

This guide contains critical information for users and IT professionals about the following Molecular Devices high-content screening (HCS) products:

- MetaXpress® Software
- MetaXpress® PowerCore™ Software
- MDCStore™ Data Manager
- AcuityXpress™ Software

IT Infrastructure and Database Support

The installation of the ImageXpress® instrument and the instrument workstation is performed by a Molecular Devices Field Service Engineer (FSE).

The installation and maintenance of all software on other clients and servers, including Molecular Devices software and the database software (that is, Oracle Database or Microsoft SQL Server), is the responsibility of the customer. We recommend these tasks are performed by an information technology professional, such as a Database Administrator (DBA). These professionals can manage and optimize the Molecular Devices software and database for your facility. Please consult with the Molecular Devices support team for guidance on the installation process.

High-content screening (HCS) generates vast amounts of data. An ImageXpress instrument can generate 250 GB to 500 GB of data each day.

As an example, the figure below shows a typical network configuration for a multi-user environment with the optional MetaXpress PowerCore Software.

This configuration features a single instrument with multiple workstations that uses multiple databases and file storage locations. If this system generated just 100 GB of image data per day for five days a week, it would require 500 GB of storage per week or over 25 TB per year. (Your actual throughput will be different.)

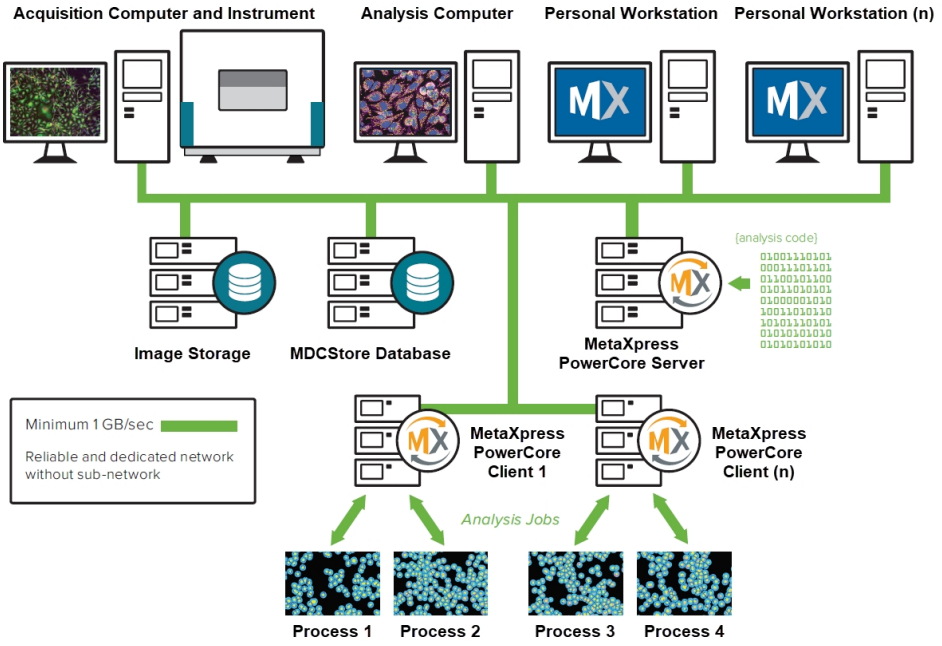

Figure 1-1: Typical network configuration for multi-user environments

To ensure the full capability of data transfer, we strongly recommend gigabit-capable firewalls, routers, and Cat 6 cabling for use with all applicable computers. Unreliable, non-dedicated networks and communication across sub-networks greatly affect the performance of data transfer. Consult with the Molecular Devices support team to determine the optimal setup for your infrastructure.

Obtaining Support

Molecular Devices is a leading worldwide manufacturer and distributor of analytical instrumentation, software, and reagents. We are committed to the quality of our products and to fully supporting our customers with the highest level of technical service.

Our Support website—www.moleculardevices.com/service-support—describes the support options offered by Molecular Devices, including service plans and professional services. It also has a link to the Molecular Devices Knowledge Base, which contains documentation, technical notes, software upgrades, safety data sheets, and other resources. If you still need assistance, you can submit a request to Molecular Devices Technical Support.

You can contact Molecular Devices Technical Support by submitting a support request through the Molecular Devices Knowledge Base at support.moleculardevices.com. You can also submit a support request by phone. For regional support contact information, go to www.moleculardevices.com/contact.

Database Support

To get the best performance from Molecular Devices High-Content Screening, we recommend that you seek assistance to install, configure, and optimize database server and client products. In particular, an experienced database administrator must configure, optimize, and tune your database for your facility. If you do not have a database administrator, contact Molecular Devices for a list of consultants.

Oracle Database and Microsoft SQL Server are not Molecular Devices products, and the instructions provided with Molecular Devices documentation for these products are offered for guidance only. For details on database installation, security, operation, and optimization, contact the appropriate software vendor.

Chapter 2: AcuityXpress Software, MetaXpress PowerCore Software, and MetaXpress Software Offline Analysis Clients

This section describes the specifications for the following:

- AcuityXpress Software
- MetaXpress Software
  - Version 6.7
  - Version 6.6
  - Version 6.5
  - Version 6.3
  - Version 6.2
  - Version 6.1
  - Version 5.x
- MetaXpress PowerCore Software
  - Version 1.5
  - Version 1.4
  - Version 1.3 and earlier

Computer Specifications

Table 2-1: Computer Specifications for AcuityXpress Software Clients

Item	Minimum	Recommended
Computing Hardware	Windows-compatible, 64-bit, 2 CPU cores	Windows-compatible, 64-bit, 4 CPU cores or more
Operating System	Microsoft Windows 10, version 1803, Professional or Enterprise, 64 bit[1]	Microsoft Windows 10, version 2004, Professional or Enterprise, 64 bit[1]
RAM	2 GB	8 GB or more
Hard Disk Space for Client Programs	10 GB	10 GB or more
Graphic Display	512 MB video RAM	1 GB or more video RAM, dual monitor option
USB Ports for Software Security Keys	2 USB ports	2 USB ports
Network Card	10/100/1000 Mbps (for maximum throughput, use a 1000 Mbps or higher dedicated LAN)	

[1] The AcuityXpress Software is installed and runs as a 32-bit application on a 64-bit operating system. See Supported Operating Systems on page 11.

Table 2-2: Computer Specifications for MetaXpress Software Offline Analysis Clients

Item	Minimum	Recommended
Computing Hardware	Windows-compatible, 64-bit, 2 CPU cores	Windows-compatible, 64-bit, 6 CPU cores or more
Operating System	Microsoft Windows 10, version 1803, Professional or Enterprise, 64 bit[1]	Microsoft Windows 10, version 2004, Professional or Enterprise, 64 bit[1]
RAM	8 GB	16 GB or more
Hard Disk Space for Client Programs	10 GB	10 GB or more
Graphic Display	512 MB video RAM	2 GB or more video RAM, dual monitor option, NVIDIA-based graphics hardware
USB Ports for Software Security Keys	2 USB ports	2 USB ports
Network Card	10/100/1000 Mbps (for maximum throughput, use a 1000 Mbps or higher dedicated LAN)	

[1] See Supported Operating Systems on page 11.

Supported Operating Systems

Table 2-3: Supported Operating System for AcuityXpress Clients

Operating System	2.2	2.x
Windows 10 Professional or Enterprise, 64-bit[1]	X[2]	X[2]
Windows 7 Professional, Enterprise, or Ultimate, 64-bit[1]	X[2]	X[2]
Windows 7 Professional, Enterprise, or Ultimate, 32-bit[1]		X

[1] The software is not supported on Windows 10 Home, Windows 7 Starter, Home Basic, or Home Premium editions.

[2] The AcuityXpress Software is installed and runs as a 32-bit application on a 64-bit operating system. A separate 32-bit ODBC connection must be created.

Table 2-4: Supported Operating System for MetaXpress Software Offline Analysis Clients

Operating System	6.7, 6.6, 6.5	6.3, 6.2, 6.1	5.x
Windows 10, Professional or Enterprise, 64-bit[1]	X[2]		
Windows 7, Professional, Enterprise, or Ultimate[2], 64-bit[1]	X[2]	X[2]	X[2]
Windows 7, Professional, Enterprise, or Ultimate, 32-bit[1]			X[2]

[1] The software is not supported on Windows 10 Home, Windows 7 Starter, Home Basic, or Home Premium editions.

[2] Meta Imaging Series Administrator and MDCStore Tools Utility need to be running with local administrator privileges. See the Molecular Devices Knowledge Base at support.moleculardevices.com for more information.

Table 2-5: Supported Operating System for MetaXpress PowerCore Software Clients

Operating System	1.5	1.4	1.3 and earlier
Windows 10, Professional or Enterprise, 64-bit[1]	X		
Windows Server 2016	X		
Windows 7, Professional, Enterprise, or Ultimate, 64-bit[1]	X	X	X
Windows 7, Professional, Enterprise, or Ultimate, 32-bit[1]			X

[1]The software is not supported on Windows 10 Home, Windows 7 Starter, Home Basic, or Home Premium editions.

Note: We recommend using the newest version of the MetaXpress PowerCore Software.

The optional MDCStore Xchange Software uses your default web browser to create and schedule import and export operations and is supported on Windows 7 (64-bit) and Windows 10.

MDCStore Xchange Software supports the following web browsers:

- Microsoft Internet Explorer (version 9 or later)
- Microsoft Edge (Chromium version)
- Mozilla Firefox
- Apple Safari
- Google Chrome

Note: The MDCStore Xchange Software must be installed on the same sub-network as your license key.

Chapter 3: MDCStore Database Solution

Server specifications depend on the size of your organization. Discuss your server requirements with your computer vendor, your IT department, and Molecular Devices technical support to determine the optimal configuration for the size of your organization.

The installation, tuning, and optimization of the database should be performed by a professional Database Administrator. Contact Molecular Devices for recommendations on the use of outside professional services.

Database Requirements

Install one of the following databases on a server dedicated to the imaging applications.

Note: We strongly recommend that you do not share the server with other applications.

- Microsoft SQL Server 2019 (Standard or Enterprise)
- Microsoft SQL Server 2017 (Standard or Enterprise)
- Microsoft SQL Server 2016 (Standard or Enterprise)
- Microsoft SQL Server 2014 (Standard or Enterprise)
- Microsoft SQL Server 2012 (Standard, Enterprise, or Datacenter)
- Oracle 18c
- Oracle 12c R2
- Oracle 11g R2

Minimum Server Specifications

Using the minimum recommendations, the same computer can run both the MDCStore Database and the file server together. However, for best performance, we recommend running the MDCStore Database and the file server on separate computers.

- Windows-compatible 64-bit computer with a 2 GHz Intel Pentium 4 or Xeon processor
- Windows Server 2012 R2 (64-bit)
- 8 GB system memory (RAM)
- 100 GB available hard disk space for database
- Greater than 1 TB for local image storage (1 TB SATA hard drive)

Recommended Server Specifications

- 64-bit computer with the fastest Intel Core multi-core processor
- Operating system supported by database application in use
- 12 GB RAM or more

> **Note:** RAM requirements may increase with database size. We recommend that a DBA regularly monitor database size and RAM usage to ensure optimal performance.

- 1 TB or more available space on a SATA or SCSI Raid 0, 5, or 10 storage subsystem
- 10/100/1000 Mbps Gigabit network card

Image Storage Locations

For best performance, we recommend running the MDCStore Database and the file server on separate computers.

For details on the differences between using the UNC path or using the MDC File Server to configure the image storage location for the MDCStore database, log in to the Molecular Devices Knowledge Base at support.moleculardevices.com, and search for **MDCStore UNC Path**.

MDC File Server, File Server Manager

> **Note:** MDC File Server is optional; UNC paths, described in the next section, may be used instead.

- Windows-compatible 64-bit computer with a 2 GHz or faster processor
- One of the following:
  - Windows Server 2012 R2 (64-bit)
  - Windows Server 2016 (64-bit)
  - Windows 10 version 1803 or later (64 bit)
- 1 GB RAM or more
- 2 TB or more available space on a SATA or SCSI Raid 0, 5, or 10 storage sub-system
- 10/100/1000 Mbps Gigabit network card

* Application needs to run with local administrator privileges

UNC Paths

For use with MetaXpress PowerCore Software, the computer providing the UNC path should support multiple simultaneous connections. Windows 7 and Windows 10 support up to 20 connections. The performance of MetaXpress PowerCore Software may be affected with a high number of simultaneous connections.

> **Note:** To check the maximum number of connections, log on with local Administrator rights. Click **Start > Run**, enter **cmd**, and click **OK**. Enter **net config server** and view the **Maximum Logged On Users** number, which is the maximum number of inbound connections.

Chapter 4: MetaXpress PowerCore Clients and Servers

For best performance, use separate computers for the MetaXpress PowerCore Server, MetaXpress PowerCore Clients, MDCStore Database, and the file server.

For the database server, to ensure optimal system performance use the recommended specifications rather than the minimum. See Table 2-5: Supported Operating System for MetaXpress PowerCore Software Clients on page 11.

For the computer specifications required for MetaXpress PowerCore Servers and Clients Software version 1.5 and later, see Table 4-1: MetaXpress PowerCore Servers and Clients Version 1.5 and Later on page 15.

For a list of validated MetaXpress PowerCore Server operating systems and MetaXpress PowerCore Client operating systems for each supported database, see Table 4-3: Validated Windows Configurations for Microsoft SQL and Oracle with the MetaXpress PowerCore Server and/or Client on page 18.

While MetaXpress PowerCore Software can be configured in a “seti@home” mode with clients throughout the network working in a screensaver mode, this configuration will not provide the maximum performance expected from the MetaXpress PowerCore Software. To take full advantage of the speed of MetaXpress PowerCore Software, use dedicated computers for analysis with the recommended specifications.

Table 4-1: MetaXpress PowerCore Servers and Clients Version 1.5 and Later

Item	Minimum	Recommended
Computing Hardware	Windows-compatible, 64-bit with the fastest Intel Core multi-core processor	
Processor Cores (Server)	• 1 core for the operating system • 1 core per server	• 1 core for the operating system • 1 core for every two clients supported by the server
Processor Cores (Clients)	• 1 core for the operating system • 1 core per client	• 1 core for the operating system • 1 core per client
3D Analysis Processor Cores (Clients)	• 1 core for the operating system • 2 cores per client (If your system uses Hyper-Threading, count each logical core separately)	• 1 core for the operating system • 2 cores per client (If your system uses Hyper-Threading, count each logical core separately)

Table 4-1: MetaXpress PowerCore Servers and Clients Version 1.5 and Later (continued)

Item	Minimum	Recommended
Operating System	See Validated Windows Configurations for Microsoft SQL and Oracle with the MetaXpress PowerCore Server and/or Client on page 18 Note that Windows 7 and Windows 10 have a limit of 20 remote device connections. For optimal performance, we highly recommend using a Server Operating System to host the MetaXpress PowerCore Server	See Validated Windows Configurations for Microsoft SQL and Oracle with the MetaXpress PowerCore Server and/or Client on page 18 Windows Server 2016
Database Server Software	See Validated Windows Configurations for Microsoft SQL and Oracle with the MetaXpress PowerCore Server and/or Client on page 18	
RAM (Server)	512 MB	2 GB or more for 8 distributed processes 4 GB for 16 distributed processes
RAM (Clients)	512 MB per CPU	1 GB or more per CPU
3D Analysis RAM (Server)	4 GB for server process	8 GB for server process
3D Analysis RAM (Clients)	2 GB per client	4 GB per client
Hard Disk Space for Server and Image Storage	10 GB or more	
USB port for Software security key (Server only)	1 open USB port on Server computer or on another available computer on the network	

We recommend using the same operating system on both the MetaXpress PowerCore server and clients.

As an example, the following table lists the requirements for a PowerCore server with four clients.

Table 4-2: Example Requirements for a PowerCore Server with Four Clients

Item	Without 3D Analysis	With 3D Analysis
Operating System	Windows 10 or Windows Server 2016	Windows 10 or Windows Server 2016
Processor Cores	6 cores (1 for the operating system, 1 for the server, and 1 for each client)	10 cores (1 for the operating system, 1 for the server, and 2 for each client)
RAM	6 GB (2 for the server and 1 for each client)	24 GB (8 for the server and 4 for each client)

The following table lists the database drivers that Molecular Devices has validated for use with supported Windows operating systems. Other drivers may also work.

Table 4-3: Validated Windows Configurations for Microsoft SQL and Oracle with the MetaXpress PowerCore Server and/or Client

Operating System	Database	Database Driver (Version)
Windows 10, 64-bit	MS SQL 2019	ODBC Driver 17 for SQL Server (2017.175.01.01)
	MS SQL 2017	ODBC Driver 13 for SQL Server (2017.140.1000.169)
	MS SQL 2016	ODBC Driver 13 for SQL Server (2015.131.5026.00)
	MS SQL 2014	ODBC Driver 11 for SQL Server (2014.120.6024.00)
	MS SQL 2012	SQL Server Native Client 11.0 (11.0.7001.00)
	Oracle 18c	Oracle in OraDB18Home1 (18.00.00.00)
	Oracle 12c R2	Oracle in OraDB12Home1 (12.02.00.01)
	Oracle 11g R2	Oracle in OraDB11g_home1 (11.02.00.01)
Windows 7, 64-bit	MS SQL 2019	Not supported
	MS SQL 2017	Not supported
	MS SQL 2016	Not supported
	MS SQL 2014	ODBC Driver 11 for SQL Server (2014.120.6024.00)
	MS SQL 2012	SQL Server Native Client 11.0 (2011.110.7001.00)
	Oracle 18c	Oracle in OraDB18Home1 (18.00.00.00)
	Oracle 12c R2	Oracle in OraDB12Home1 (12.02.00.01)
	Oracle 11g R2	Oracle in OraDB11g_home1 (11.02.00.01)

The following table lists the database drivers that Molecular Devices has validated for use with supported Windows Server operating systems. Other drivers may also work.

Table 4-4: Validated Windows Server Configurations for Microsoft SQL and Oracle with the MetaXpress PowerCore Server and/or Client

Operating System	Database	Database Driver (Version)
Windows Server 2016, 64-bit	MS SQL 2019	ODBC Driver 17 for SQL Server (2017.173.00.01)
	MS SQL 2017	ODBC Driver 13 for SQL Server (2017.140.1000.169)
	MS SQL 2016	ODBC Driver 13 for SQL Server (2015.131.5026.00)
	MS SQL 2014	ODBC Driver 11 for SQL Server (2014.120.6024.00)
	MS SQL 2012	SQL Server Native Client 11.0 (2011.110.7001.00)
	Oracle 18c	Oracle in OraDB18Home1 (18.00.00.00)
	Oracle 12c R2	Oracle in OraDB12Home1 (12.02.00.01)
	Oracle 11g R2	Oracle in OraDB11g_home1 (11.02.00.01)
Windows Server 2012 R2, 64-bit	MS SQL 2019	Not Supported
	MS SQL 2017	ODBC Driver 13 for SQL Server (2017.140.1000.169)
	MS SQL 2016	ODBC Driver 13 for SQL Server (2015.131.5026.00)
	MS SQL 2014	ODBC Driver 11 for SQL Server (2014.120.6024.00)
	MS SQL 2012	SQL Server Native Client 11.0 (2011.110.7001.00)
	Oracle 18c	Oracle in OraDB18Home1 (18.00.00.00)
	Oracle 12c R2	Oracle in OraDB12Home1 (12.02.00.01)
	Oracle 11g R2	Oracle in OraDB11g_home1 (11.02.00.01)

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