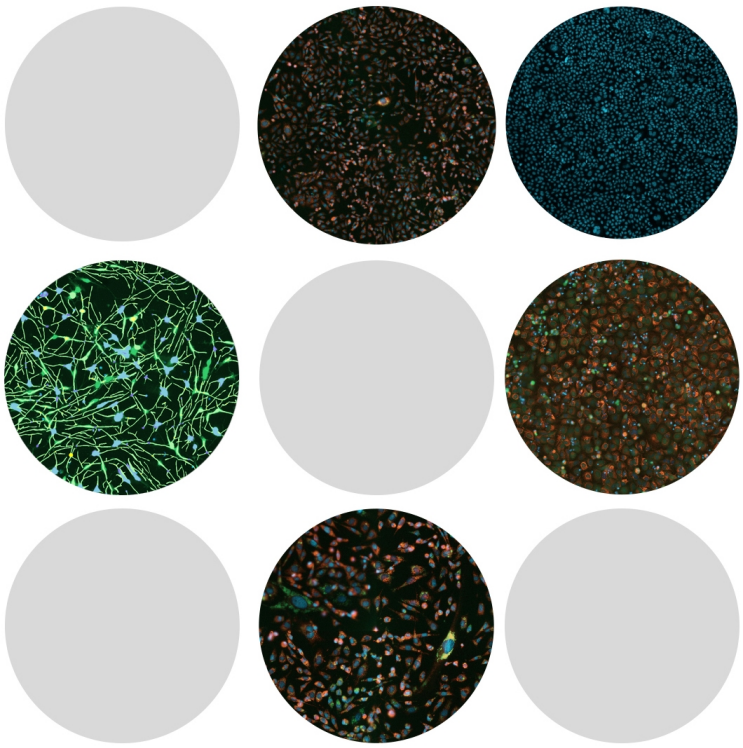

CellReporterXpress®

Image Acquisition and Analysis Software

Version 2.5

Installation Guide

MOLECULAR DEVICES

5058771 G
November 2019

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Chapter 1: CellReporterXpress Image Acquisition and Analysis Software

1

The Molecular Devices® CellReporterXpress® Image Acquisition and Analysis Software is the user interface for the Molecular Devices® ImageXpress® Pico Automated Cell Imaging System.

The CellReporterXpress software integrates image acquisition and analysis into a unified workflow. Along with the ImageXpress Pico system, the CellReporterXpress software streamlines automated imaging to offer a simplified solution for scaling up microscopy. Its features include:

- A web-based interface that runs on many browsers, including those found on iPads and Android tablets.
- Over 25 available predefined experimental protocols.
- High-powered analysis tools equivalent to those found in desktop applications.
- Easy-to-manage data with no requirement to configure a database.
- A simplified user interface that is easy to learn and easy to use.

Terminology

This guide uses the following terminology:

- **Instrument**: The ImageXpress® Pico Automated Cell Imaging System, which is used by the CellReporterXpress software to capture images.
- **Host Computer**: The computer running the core CellReporterXpress software services (MD.CoreService, MD.DataService, and MD.WebService), along with the services for analysis operations (MD.AnalysisService) and storage operations (MD.LocationService). The host computer communicates with the instrument, remote analysis computers, remote storage computers, and client workstations.
- **Client Workstation**: A computer or tablet that connects to the host computer. A client workstation uses a supported browser to display the CellReporterXpress software user interface and interact with the software.
- **Storage Operations**: The process of writing and reading data during image acquisition and analysis. Storage operations are performed by the Location Service (MD.LocationService) on the host computer or on one or more remote computers. Computers performing storage operations must have edit access to defined storage locations (for example, network drives).
- **Analysis Operations**: The process of stitching, measuring, and analyzing on images. Analysis operations are performed by the Analysis Service (MD.AnalysisService) on the host computer or on one or more remote computers.

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 our Knowledge Base, which contains documentation, technical notes, software upgrades, safety data sheets, and other resources. If you still need assistance after consulting the Knowledge Base, you can submit a request to Molecular Devices Technical Support.

Technical Support

You can contact Molecular Devices Technical Support by submitting a support request through the Knowledge Base or by phone. To find regional support contact information, visit www.moleculardevices.com/contact.

You need the instrument serial number.

Documentation

Review the product documentation on the Knowledge Base, including installation guides and user guides. In addition, online Help is available within the CellReporterXpress software. Press **F1** to access Help for the current page.

Additional Resources

Web-based microscopy courses:

- www.leica-microsystems.com/science-lab
- www.ibiology.org/ibioeducation/taking-courses/ibiology-microscopy-short-course.html

The Molecular Probes Handbook offers advice on fluorescent probes and can help you determine if there are better stains available for your analysis:

- www.lifetechnologies.com/us/en/home/references/molecular-probes-the-handbook.html

Product Documentation

The following guides are available on the Molecular Devices Knowledge Base at mdc.custhelp.com:

- *CellReporterXpress Installation Guide*
- *CellReporterXpress Release Notes*
- *CellReporterXpress User Guide*
- *ImageXpress Pico Pre-Installation Guide*
- *ImageXpress Pico Installation Guide*
- *ImageXpress Pico User Guide*
- *ImageXpress Pico Calibration Kit Guide*

In addition, the CellReporterXpress software includes context-sensitive Help that you can access from within the software. Just press the **F1** key from within the software to view Help for the current page.

Tip: Molecular Devices recommends that you review the documentation before installing or using the ImageXpress Pico system or the CellReporterXpress software.

About This Guide

This guide is intended for the scientist or IT professional who will be installing and configuring the CellReporterXpress software. You can configure the CellReporterXpress software to perform operations on a single computer or on multiple computers. This guide contains critical information that helps you configure a system to best meets your needs.

The information in this guide is subject to change without notice. Molecular Devices recommends that you review the guide on the Knowledge Base for the most up-to-date information.

Chapter 2: Getting Started

Items Required to Install the Software

You will need the following items to install the CellReporterXpress software:

- **Host Computer**: Unless you purchased the ImageXpress Pico system with the optional computer, you must provide the computer that will be the host computer. See System Requirements on page 15 for details.
- **Hardware Key**: Molecular Devices provides the SafeNet Sentinel USB hardware key (also called a "dongle"), which is the hardware component of your license to run the software. See Software License on page 10 for details.

- **Installer**: Download the CellReporterXpress Installation Utility from the Molecular Devices Knowledge Base. See Downloading the Installation Utility on page 30 for details.

Software License

The license to run the CellReporterXpress software on the host computer is comprised of a software component and a hardware component. The license determines how many users/clients can connect to the CellReporterXpress software at once, how many concurrent analyses can be run, and the availability of specific analysis algorithms.

Software Component

After installation, the software component consists of files located in the following folder:

```
%ProgramData%\Molecular Devices\CellReporterXpress
```

CAUTION! Do not move, modify, or delete the license files.

If you need to reinstall the license files, run the CellReporterXpress Installation Utility again. You can also go to the following web page and download the license files from Molecular Devices:

www.meta.moleculardevices.com/software/crx/authorize

You will need the software system ID and the registered email address to download the license files.

Note: If the host computer is not connected to the Internet, download the license files to another computer that is connected to the Internet and then copy them to the host computer.

Hardware Component

The hardware component is a SafeNet Sentinel USB hardware key. The hardware key must be inserted in a USB port on the host computer to install or run the CellReporterXpress software.

System Configurations

To determine the best configuration for the CellReporterXpress software, consider the needs of your users along with your networking constraints and hardware availability.

System configurations for the CellReporterXpress software include the following:

- Standalone Configuration, see below
- Network Configuration, see page 12
- Server Configuration, see page 13

This guide describes the procedures for installing each configuration.

Standalone Configuration

A standalone configuration is the simplest configuration. It uses a direct Ethernet connection between the instrument and the host computer. The CellReporterXpress software runs on the host computer in a local browser. All CellReporterXpress software services are installed on the host computer, which also performs all analysis operations and data storage operations.

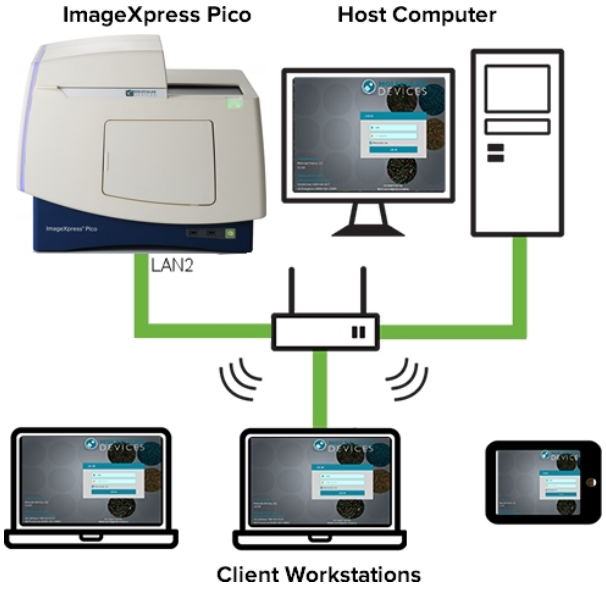
Note: You can also use a network connection between the host computer and the instrument. The instrument appears on the network with the prefix "IXP-" followed by the serial number.

To set up a standalone configuration, install a host computer. See Installing the CellReporterXpress Software on page 29 for details.

Network Configuration

A network configuration is more advanced than a standalone configuration. In a network configuration, the instrument and the host computer are each connected to the network. The CellReporterXpress software runs in a browser on the host computer. All CellReporterXpress software services (specifically MD.CoreService, MD.DataService, MD.WebService, MD.LocationService, and MD.AnalysisService) are installed on the host computer, which also performs all analysis operations and data storage operations.

In this configuration, you can set up computers and tablets as client workstations to connect to the host computer. A client workstation uses a supported browser to display the CellReporterXpress software user interface and interact with the software.



Note: The CellReporterXpress software allows multiple client workstations to simultaneously connect to the host computer. However, only one user at a time can access the instrument.

To set up a network configuration, do the following:

1. Install a host computer.
2. As needed, install a client workstation on any Windows computer running Google Chrome.

See Installing the CellReporterXpress Software on page 29 for details.

Server Configuration

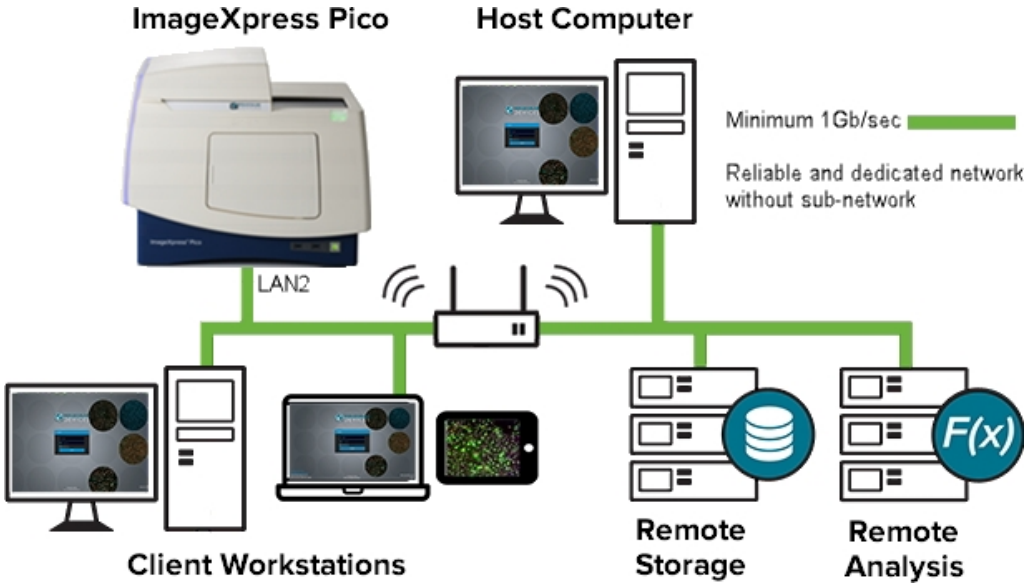
A server configuration, which is the most advanced configuration, can enhance the performance of your imaging system. In a server configuration, CellReporterXpress software functionality is distributed across several computers on the network. The host computer runs all core CellReporterXpress software services (specifically MD.CoreService, MD.DataService, MD.WebService), but you can set up more powerful computers to run the services for remote analysis (MD.AnalysisService) and remote storage (MD.LocationService).

In this configuration, you can set up computers and tablets as client workstations to connect to the host computer. A client workstation uses a supported browser to display the CellReporterXpress software user interface and interact with the software.

Analysis operations can be performed by any computer on the network that runs MD.AnalysisService. While the CellReporterXpress software license limits the number of analysis processes running concurrently, there is no limit to the number of computers running analysis operations. When you set up multiple computers for analysis operations, the CellReporterXpress software determines which computers perform analysis.

Storage operations can be performed by any computer on the network that runs MD.LocationService. There is no limit to the number of remote storage computers in the configuration. Each remote storage computer contains one or more folders mapped for storage. If the CellReporterXpress software will be used by multiple groups, you may want to organize storage by group.

Tip: For optimal data transfer, Molecular Devices recommends using a sustainable network connection with a speed of at least 1 Gb/s.



Note: The CellReporterXpress software allows multiple client workstations to simultaneously connect to the host computer. However, only one user at a time can access the instrument.

To set up a server configuration, do the following:

1. Install a host computer.
2. As needed, install one or more remote analysis computers.
3. As needed, install one or more remote storage computers.
4. As needed, install a client workstation on any Windows computer running Google Chrome.

See Installing the CellReporterXpress Software on page 29 for details.

System Requirements

Host Computer in a Standalone Configuration or Network Configuration

In a standalone configuration or a network configuration, the host computer performs all analysis and storage. In these configurations, the host computer must meet the following minimum specifications:

Item	Minimum Requirement	Notes
Operating System	Microsoft Windows 10	Pro and Enterprise editions are supported.
	Microsoft Windows Server 2016	Standard edition is supported.
Browser	Google Chrome	Must be installed on the host computer before installing the software. This version of the CellReporterXpress software was tested with Google Chrome 77 (64-bit).
CPU Speed	2.4 GHz	See Analysis Operations on page 16 for details.
Available Disk Space	---	See Storage Operations on page 17 for details.
Logical Processors	10	10 logical processors can support 4 concurrent analyses. For each additional concurrent analysis, add 2 logical processors.
RAM	12 GB	12 GB of RAM supports 4 concurrent analyses. For each additional concurrent analysis, add 2 GB of memory.
Available Ethernet Ports	1 (network) 2 (standalone)	In a standalone configuration, where the instrument is directly connected to the host computer, you may also want to connect the host computer to your network. In this case, connect the host computer to the network using a second Ethernet port, a wireless connection, or a USB-to-Ethernet adapter. Do not use a wireless connection or a USB-to-Ethernet adapter to connect the host computer to the instrument.
Display Resolution	---	Optimized for 1920 x 1080 (Full HD).

Host Computer in a Server Configuration

In a server configuration, analysis operations and storage operations can be performed remotely. In these configurations, the host computer must meet the following minimum specifications:

Item	Minimum Requirement	Notes
Operating System	Microsoft Windows 10	Pro, Enterprise, and Education editions are supported.
	Microsoft Windows Server 2016	Standard edition is supported.
Browser	Google Chrome	Must be installed on the host computer before installing the software. This version of the CellReporterXpress software was tested with Google Chrome 77 (64-bit).
CPU Speed	2.4 GHz	See Analysis Operations, see below for details.
Available Disk Space	---	See Storage Operations on page 17 for details.
Logical Processors	2	
RAM	4 GB	
Available Ethernet Ports	1	
Display Resolution	---	Optimized for 1920 x 1080 (Full HD).

Analysis Operations

Analysis operations are best performed by computers with fast CPUs and sufficient RAM. Each concurrent analysis uses two logical processors and a minimum 2 GB of RAM. For example, to run eight concurrent analyses, a computer requires 16 logical processors and at least 16 GB of RAM. Additional RAM and processors may be used as overhead by the operating system.

Storage Operations

The amount of necessary storage space depends on several variables. To calculate the approximate storage requirement for images belonging to a plate, multiply the following:

- Number of wells
- Number of images per well
- Number of filter cubes
- Number of time points
- Image size (approximately 8 MB each)
- Pyramid storage factor (typically 1.5)

Note: The number of images collected per well depends on the area of the well to be covered. Using higher magnification requires more images to cover a significant area.

For example, for an experiment with a 96-well plate and 3 wavelengths collecting 2 images per well with 4 time points, calculate:

$$96 \times 3 \times 2 \times 4 \times 8 \times 1.5 = 27{,}648$$

So, under these conditions, approximately 27.5 GB of storage is required per plate.

Tip: The CellReporterXpress page on the Molecular Devices Knowledge Base includes a link to the ImageXpress Pico Storage Calculator that can help you determine your storage needs.

Client Workstation

In a network configuration and a server configuration, you can set up computers and tablets as client workstations to connect to the host computer. The client workstation can be any of the following:

- A Windows, macOS, or Linux computer (desktop or laptop).
- An iPad or Android tablet with a screen size of at least 9 inches, optimized for iPad Retina display at 1920 x 1080 (Full HD) or higher in full screen mode.

A client workstation uses a supported browser to display the CellReporterXpress user interface and interact with the software. The following browsers are supported:

Operating System	Browser
Microsoft Windows	Google Chrome or Mozilla Firefox
Apple macOS	Google Chrome or Apple Safari
Apple iOS	Apple Safari
Google Android	Google Chrome
Linux	Google Chrome

For a Windows computer using Google Chrome, you can install a shortcut that enables easy access the CellReporterXpress software.

Note: No installation steps are required for client workstation on a tablet, a non-Windows computers, or a computer without Google Chrome. Any client workstation can connect to the host computer using a supported browser.

Chapter 3: Pre-Installation Considerations

3

Before installing the CellReporterXpress software, review this section and plan accordingly.

The following topics in this section pertain to all configurations:

- Antivirus Software, see page 20
- User Accounts, see page 21
- File Compression and Encryption, see page 21
- Backups, see page 21
- Power Plan and Sleep Settings, see page 22
- Windows Updates and Security Patches, see page 22
- Storage Performance, see page 22

The following topics in this section pertain to server configurations only:

- Network Security, see page 22
- Network Storage Locations, see page 23
- Network Performance, see page 23
- Firewalls and Ports, see page 24

Antivirus Software

Antivirus software settings may need to be modified to prevent slowdown of the CellReporterXpress software. Stringent antivirus settings can affect the rate of data or image transfer operations.

CAUTION! Molecular Devices is not responsible for viruses or security attacks on the host computer. It is your responsibility to keep the antivirus software configuration current to avoid security risks and virus threats to the host computer.

A service exclusion prevents antivirus software from scanning the execution process of a service as well as the files the service accesses. If you are using Windows Defender, the CellReporterXpress Installation Utility will attempt to add the required exclusions and settings during installation.

Note: It is possible that your network policy may prevent the CellReporterXpress Installation Utility from adding the required exclusions and settings.

If you are not using Window Defender or if your network policy does not allow the CellReporterXpress Installation Utility to modify exclusions, do the following:

- Create an exclusion for the following services in the `%Program Files%\Molecular Devices` folder:
  - MD.CoreService (`MolDev.CoreService.exe`)
  - MD.DataService (`MolDev.DataService.exe`)
  - MD.WebService (`MolDev.WinHost.exe`)
  - MD.AnalysisService (`MolDev.AnalysisService.exe`)
  - MD.LocationService (`MolDev.LocationService.exe`)
- Create an exclusion for any paths used to store experiments.
- Enable auto updates for virus definitions to increase system security.
- Provide the ability to disable virus scanning for troubleshooting purposes.

User Accounts

Installation

During installation, the CellReporterXpress software requires administrator privileges on all applicable computers.

Running Services

CellReporterXpress software services are installed to run as user “Local System” and require extensive read-write-modify access.

Client workstations do not require special privileges on the host computer.

User Accounts

The CellReporterXpress software uses Windows user accounts integrated into the host computer. If you want to use LDAP authentication, integrate the services into Windows authentication of the host computer.

The CellReporterXpress software uses personal customization settings to enhance the user experience by storing individual user preferences. Molecular Devices strongly recommends using individual user accounts.

File Compression and Encryption

File encryption and compression can affect data access and data analysis. Molecular Devices does not guarantee performance of the CellReporterXpress software on encrypted computers or on computers with automatic compression. If you must use encryption, Molecular Devices recommends using a block-level encryption (for example, Microsoft BitLocker), which does not impact performance as much as file-level encryption.

Backups

It is your responsibility to back up the files generated by the CellReporterXpress software. The software can store data on the host computer, remote storage computers, and network drives.

Molecular Devices recommends that you back up the following:

- On the host computer and all registered storage computers, all files and folders in the `C:\ProgramData\Molecular Devices` folder.
- Any other local or networked folders that you have mapped for storage.

Note: All registered computers and mapped folders are listed in the software on the **Data Storage** page in **Configuration** mode. See the *CellReporterXpress Help* or the *CellReporterXpress User Guide* for details on **Configuration** mode.

Power Plan and Sleep Settings

It is possible that computers running a CellReporterXpress software service may time out during long experiments, particularly those that include time-series acquisitions. You can minimize these errors by customizing the power plan and sleep settings for all computers running a CellReporterXpress software service (that is, the host computer and any remote storage and remote analysis computers in the configuration). See Customizing the Power Plan and Sleep Settings on page 60 for details.

Windows Updates and Security Patches

CAUTION! Molecular Devices recommends that you apply Windows security patches as they become available.

For any computer running any CellReporterXpress software service (that is, a host computer or a remote computer used for analysis operations or storage operations), disable automated Windows updates to prevent interrupting the CellReporterXpress software or restarting the computer at an inconvenient time. Instead, configure Windows to automatically download updates and patches, but not apply them; you can apply them manually at a time when users will not be affected.

Note: When a Windows update or security patch has been applied, confirm that the network configuration (firewall settings, antivirus exceptions, and so on) has not been changed.

Storage Performance

Molecular Devices recommends that the internal drive on any computer used for storage operations have a minimum SATA III interface. External drives must use a USB 3 interface.

Network Security

The CellReporterXpress software uses HTTP for communication. It is important to note that these HTTP connections are not secured or encrypted. You may want to avoid using insecure protocols (such as HTTP) outside of your organization's secured network.

When configuring installations that might be exposed to outside parties, consider securing your CellReporterXpress communications. Some examples of how you can do this include the following:

- Installing the CellReporterXpress software with a security certificate. See Installing a Host Computer with a Security Certificate on page 40 for details.
- Using an HTTPS proxy server, which uses SSL/TLS to encrypt communications.

Note: Molecular Devices does not provide engineering, installation, or management support for installations on a secured proxy server.

Network Storage Locations

You can set up network drives for storage of images and experiment data. See Configuring the Location Service to Use a Network Drive for Storage on page 74 for details.

Network Performance

To ensure optimal data transfer, Molecular Devices highly recommends using a reliable, sustainable, and dedicated network connection of at least 1 Gb/s. Unreliable, non-dedicated networks and communication through firewalls may degrade data transfer performance. Wireless connections can be used for remote client access.

In addition, the following conditions must be met:

- All computers in the configuration should use gigabit-capable switches, routers, and category 6 cabling.
- The CellReporterXpress software supports both remote and direct Ethernet connections between the host computer and the instrument. If you experience issues with remote connections (due to firewall or network issues), Molecular Devices recommends using a direct Ethernet connection.
- The host computer and all remote computers used for analysis operations or storage operations must use static IP addresses. If you use connections by computer name, verify that you can ping each computer in the configuration from the host computer. If you use Dynamic Host Configuration Protocol (DHCP) and the IP address of a computer changes after restarting, the components used on that computer may require reassignment for the CellReporterXpress software to work properly.

CAUTION! Molecular Devices recommends that you do not change the computer name or IP address of the host computer or any remote computers used for analysis operations or storage operations after establishing connections. Any change in the host computer configuration (for example, switching network connections or connecting to a different network) can interrupt normal system operation. In such cases, a computer reboot is usually required for a computer system to adapt to new network settings. Similarly, client workstations may need to be reconfigured to locate the host computer.

- Computers and tablets that connect to the host computer must use routable IP addresses and DNS resolvable name paths.
- In a server configuration using remote computers for analysis operations or storage operations, all firewalls and routers must allow data transfer between all applicable computers using the default ports.

CAUTION! If firewalls block the default ports, system communication can fail.

Firewalls and Ports

The network connections between the host computer, instrument, remote clients, and external computers require that all firewalls and routers be configured to allow data transfer between all applicable ports.

Note:

- If any of the ports described in this section are already in use by other software, contact Molecular Devices for details on changing the ports used by the CellReporterXpress software.
- During a Client Workstation installation, a Windows Security Alert may appear noting that "Windows Firewall has blocked some features of this app". In that case, allow access on private networks and domain networks.

The section describes the default ports used by the CellReporterXpress software in the following system configurations:

- Standalone Configuration, see below
- Network Configuration, see page 25
- Server Configuration with Remote Analysis Only, see page 26
- Server Configuration with Remote Storage Only, see page 27
- Server Configuration with Remote Analysis and Remote Storage, see page 28

Standalone Configuration

In a standalone configuration, all CellReporterXpress software services (specifically MD.CoreService, MD.DataService, MD.WebService, MD.LocationService, and MD.AnalysisService) run on the host computer, which performs all analysis and data storage operations.

Computer	Port	Direction	Purpose
Host Computer	TCP 80	Inbound	Communication with the host computer (without a security certificate).
	TCP 443	Inbound	Communication with the host computer (with a security certificate).
	UDP 3702	Inbound and Outbound	Auto detection of the instrument.
	TCP 8091 TCP 9090	Outbound	Communication with the instrument. If the instrument is behind a firewall, these ports should be forwarded to the instrument IP address.

Note: The port used for inbound communication with the host computer is configurable during installation. If the default port is not available, a different port can be used.

Network Configuration

In a network configuration, all CellReporterXpress software services (specifically MD.CoreService, MD.DataService, MD.WebService, MD.LocationService, and MD.AnalysisService) run on the host computer, which performs all analysis and data storage operations.

Computer	Port	Direction	Purpose
Host Computer	TCP 80	Inbound	Communication with the host computer (without a security certificate).
	TCP 443	Inbound	Communication with the host computer (with a security certificate).
	UDP 3702	Inbound and Outbound	Auto detection of the instrument.
	TCP 8091 TCP 9090	Outbound	Communication with the instrument. If the instrument is behind a firewall, these ports should be forwarded to the instrument IP address.

Note: The port used for inbound communication with the host computer is configurable during installation. If the default port is not available, a different port can be used.

Server Configuration with Remote Analysis Only

In a server configuration with remote analysis only, the host computer runs all core CellReporterXpress software services (specifically MD.CoreService, MD.DataService, MD.WebService) along with MD.LocationService. One or more remote analysis computers run MD.AnalysisService.

Computer	Port	Direction	Purpose
Host Computer	TCP 80	Inbound	Communication with the host computer (without a security certificate).
	TCP 443	Inbound	Communication with the host computer (with a security certificate).
	UDP 3702	Inbound and Outbound	Auto detection of the instrument.
	TCP 8091 TCP 9090	Outbound	Communication with the instrument. If the instrument is behind a firewall, these ports should be forwarded to the instrument IP address.
	TCP 12323	Inbound	Communication with remote analysis computer.
	TCP 12325	Outbound	
Remote Analysis Computer(s)	TCP 12323	Outbound	Communication with the host computer.
	TCP 12325	Inbound	

Note: The port used for inbound communication with the host computer is configurable during installation. If the default port is not available, a different port can be used.

Server Configuration with Remote Storage Only

In a server configuration with remote storage only, the host computer runs all core CellReporterXpress software services (specifically MD.CoreService, MD.DataService, MD.WebService) along with MD.AnalysisService. One or more remote storage computers run MD.LocationService.

Computer	Port	Direction	Purpose
Host Computer	TCP 80	Inbound	Communication with the host computer (without a security certificate).
	TCP 443	Inbound	Communication with the host computer (with a security certificate).
	UDP 3702	Inbound and Outbound	Auto detection of the instrument.
	TCP 8091 TCP 9090	Outbound	Communication with the instrument. If the instrument is behind a firewall, these ports should be forwarded to the instrument IP address.
	TCP 12323	Inbound	Communication with the remote storage computer.
	TCP 12324	Outbound	
Remote Storage Computer(s)	TCP 12323	Outbound	Communication with the host computer.
	TCP 12324	Inbound	

Note: The port used for inbound communication with the host computer is configurable during installation. If the default port is not available, a different port can be used.

Server Configuration with Remote Analysis and Remote Storage

In a server configuration with both remote storage and remote analysis, the host computer runs all core CellReporterXpress software services (specifically MD.CoreService, MD.DataService, MD.WebService). One or more remote analysis computers run MD.AnalysisService and one or more remote storage computers run MD.LocationService.

Computer	Port	Direction	Purpose
Host Computer	TCP 80	Inbound	Communication with the host computer (without a security certificate).
	TCP 443	Inbound	Communication with the host computer (with a security certificate).
	UDP 3702	Inbound and Outbound	Auto detection of the instrument.
	TCP 8091 TCP 9090	Outbound	Communication with the instrument. If the instrument is behind a firewall, these ports should be forwarded to the instrument IP address.
	TCP 12323	Inbound	Communication with the remote storage computer and the remote analysis computer.
	TCP 12324	Outbound	Communication with the remote storage computer.
	TCP 12325	Outbound	Communication with the remote analysis computer.
Remote Analysis Computer(s)	TCP 12323	Outbound	Communication with the host computer.
	TCP 12325	Inbound	
Remote Storage Computer(s)	TCP 12323	Outbound	
	TCP 12324	Inbound	

Note: The port used for inbound communication with the host computer is configurable during installation. If the default port is not available, a different port can be used.

Chapter 4: Installing the CellReporterXpress Software

This section describes how to use the CellReporterXpress Installation Utility to install the CellReporterXpress software.

The following symbols are used throughout the CellReporterXpress Installation Utility to indicate the status of each step:

Symbol	Description
	The latest available version of the component is installed, or the prerequisite or requirement has been met.
	The component is not installed, or the prerequisite or requirement has not been met.
	The component or prerequisite is optional. For example, an earlier version of the component or prerequisite might exist on the computer, and upgrading to the latest version is optional.
	The component or prerequisite is not required or not applicable with your system or software configuration.

Before You Begin

Before installing the CellReporterXpress software, confirm that the following is true:

- The host computer hardware meets or exceeds the minimum requirements. See System Requirements on page 15.
- You are logged in to the host computer as an administrative user.
- The computer can connect to the instrument either through the local network or through a direct Ethernet connection. To confirm, ping the instrument using the prefix "IXP-" followed by the serial number. The serial number is located on the back panel of the instrument. Use dashes between the groups of numbers in the serial number. For example, if the serial number of an instrument is 12 345-6789, enter the following command to ping the instrument:
  ```
  ping IXP-12-345-6789
  ```
- Google Chrome is installed on the host computer. If you are installing a host computer and Google Chrome is not installed, go to www.google.com/chrome to download and install Google Chrome.

Downloading the Installation Utility

You can download the CellReporterXpress Installation and Configuration Utility (and all related documentation) from the Molecular Devices Knowledge Base.

To download the CellReporterXpress Installation Utility:

1. In a browser, go to the following web page:
   mdc.custhelp.com
2. Click **Log In** and enter your credentials to log in to the Knowledge Base.
   If you do not have a Knowledge Base account, click **Create Account** and follow the on-screen instructions.
3. Go to the ImageXpress Pico with CellReporterXpress Page at
   www.meta.moleculardevices.com/pico.
4. Under **Downloads**, click **CellReporterXpress**.
5. If you are upgrading from a previous version of the software and a firmware update is required, click **Firmware Update** and follow the on-screen instructions to update the firmware.
6. Click the **CellReporterXpress** link for the current release.
7. Click **Download**.
8. After the download completes, navigate to your **Downloads** folder (if needed).
9. Right-click the CellReporterXpress ZIP file (**CRX 2.5.xxx.zip**) and select **Extract All**.
10. Click **Extract**.

Installing the Software

The CellReporterXpress software can be installed in different configurations. See System Configurations on page 11 for details. Depending on your configuration, install the required software as follows:

Configuration	Installation Steps
Standalone	• Installing a Host Computer without a Security Certificate, see page 32 or Installing a Host Computer with a Security Certificate, see page 40
Network	• Installing a Host Computer without a Security Certificate, see page 32 or Installing a Host Computer with a Security Certificate, see page 40 • Installing a Client Workstation, see page 57
Server with Remote Storage	• Installing a Host Computer without a Security Certificate, see page 32 or Installing a Host Computer with a Security Certificate, see page 40 • Installing a Remote Storage Computer, see page 53 • Installing a Client Workstation, see page 57
Server with Remote Analysis	• Installing a Host Computer without a Security Certificate, see page 32 or Installing a Host Computer with a Security Certificate, see page 40 • Installing a Remote Analysis Computer, see page 49 • Installing a Client Workstation, see page 57
Server with Remote Storage and Remote Analysis	• Installing a Host Computer without a Security Certificate, see page 32 or Installing a Host Computer with a Security Certificate, see page 40 • Installing a Remote Analysis Computer, see page 49 • Installing a Remote Storage Computer, see page 53 • Installing a Client Workstation, see page 57

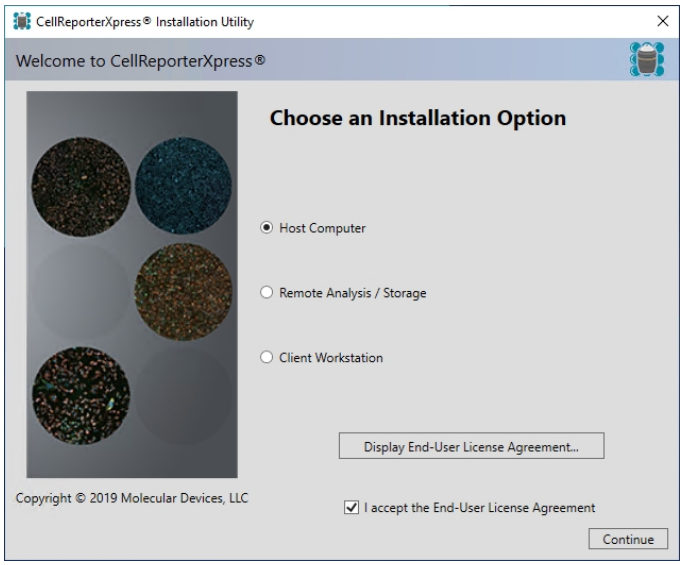
Installing a Host Computer without a Security Certificate

The host computer runs the core CellReporterXpress software services (MD.CoreService, MD.DataService, and MD.WebService), along with the services for analysis operations (MD.AnalysisService) and storage operations (MD.LocationService). It communicates with the instrument, remote analysis computers, remote storage computers, and client workstations.

Note: Your organization may require you to secure all data transfers with encryption. In this case, see Installing a Host Computer with a Security Certificate on page 40 for details on installing a CellReporterXpress host computer with a security certificate.

To install a host computer without a security certificate:

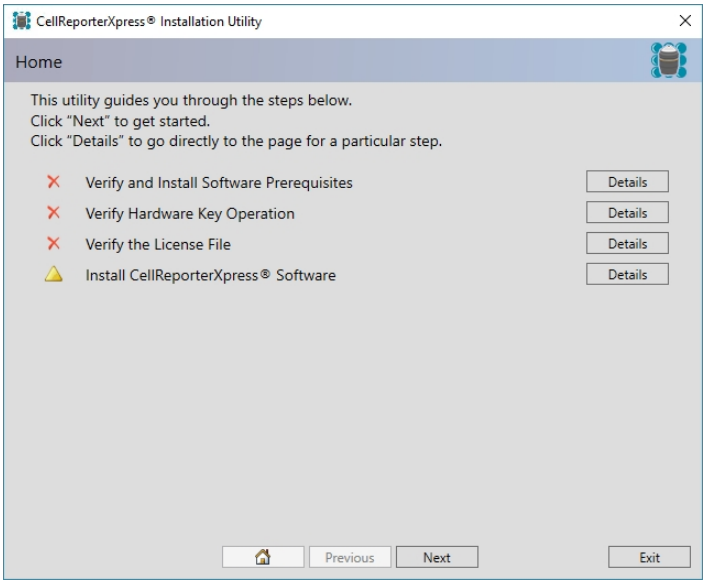
1. Browse to the location of the CellReporterXpress Installation Utility folder that you downloaded earlier.
2. Double-click the **CRX 2.5.xxx.zip** folder.
3. Right-click **setup.exe** and select **Run as administrator** to start the CellReporterXpress Installation Utility.



4. Select the **Host Computer** option.
5. Click **Display End-User License Agreement**.
6. Review the license agreement.
7. If you accept the license agreement, do the following:
   a. Select the **I accept the End-User License Agreement** check box.
   b. Click **Continue**.

Note: If you do not accept the license agreement, you cannot install the software.

The **Home** page summarizes the CellReporterXpress installation steps.



8. Click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

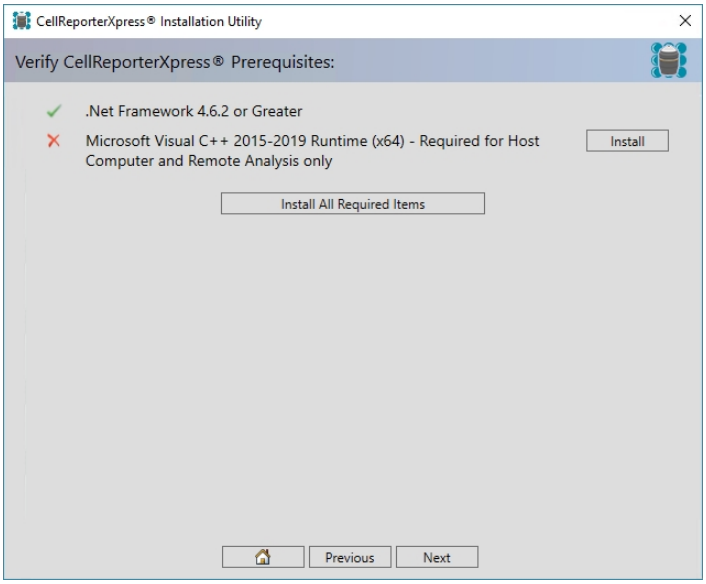
Note: You can also navigate to a specific installation step by clicking **Details** for that step.

The CellReporterXpress host computer requires that the following software be installed:

- Microsoft .NET Framework 4.6.2 or later
- One of the following:
  - Microsoft Visual C++ 2015 Runtime (x64)
  - Microsoft Visual C++ 2017 Runtime (x64)
  - Microsoft Visual C++ 2019 Runtime (x64)
- Google Chrome

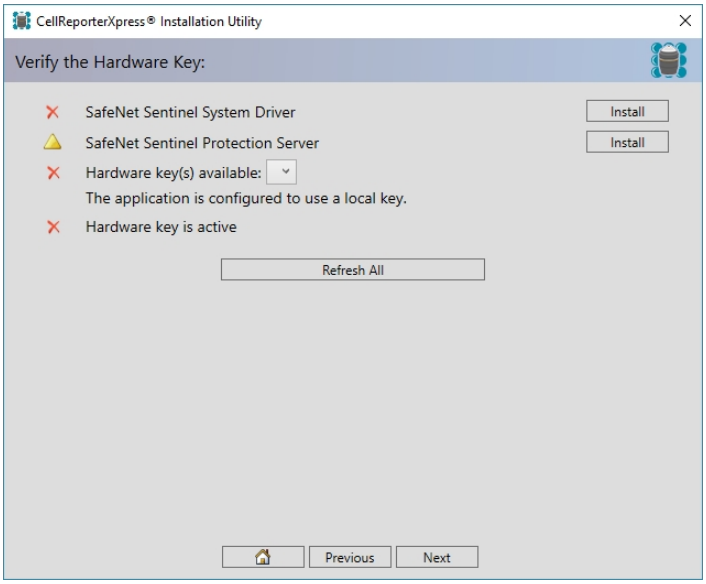
Note:

- .NET Framework 4.6.2 or later is installed with all recent versions of Windows 10. To check which version of .NET Framework is installed, go to docs.microsoft.com/en-us/dotnet/framework/migration-guide/how-to-determine-which-versions-are-installed.
- The CellReporterXpress Installation Utility does not install Google Chrome. If Chrome is not installed, go to www.google.com/chrome/browser to download and install Chrome before continuing to install the CellReporterXpress software.



9. For any prerequisite that is not met (indicated by a red ✕ symbol next to the item), do the following:
   a. Click **Install** to install specific prerequisites.
   b. Follow the on-screen instructions to install the prerequisite.
10. When all prerequisites are installed (indicated by a green ✓ symbol next to each item), click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

11. Remove the hardware key from its case and insert it in a USB port on the host computer.
12. If the SafeNet Sentinel software is not installed (indicated by a red ✕ symbol next to the item), do the following:
    a. If needed, on the **Verify the Hardware Key** page, next to **SafeNet Sentinel System Driver**, click **Install**.
    b. Follow the on-screen instructions to install the driver.
    c. After the driver is installed, click **Refresh All**.



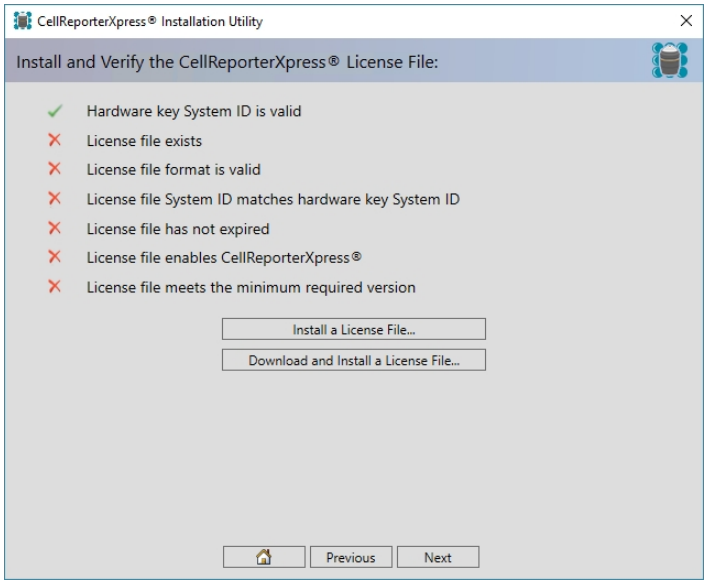
13. When all items are verified (indicated by a green ✓ symbol next to each item), click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

14. On the **Install and Verify the CellReporterXpress License File** page, do one of the following:
    - If you have a license file, click **Install a License File** and browse to the location of your license file.
    - If you do not have a license file and you are connected to the Internet, click **Download and Install a License File**, then enter the registered email address and click **OK**.

      Note: You must use the email address registered with Molecular Devices. You can find the registered email on the welcome letter inside the hardware key case. If you do not know the registered email address, contact Molecular Devices Technical Support. See Obtaining Support on page 7 for details.

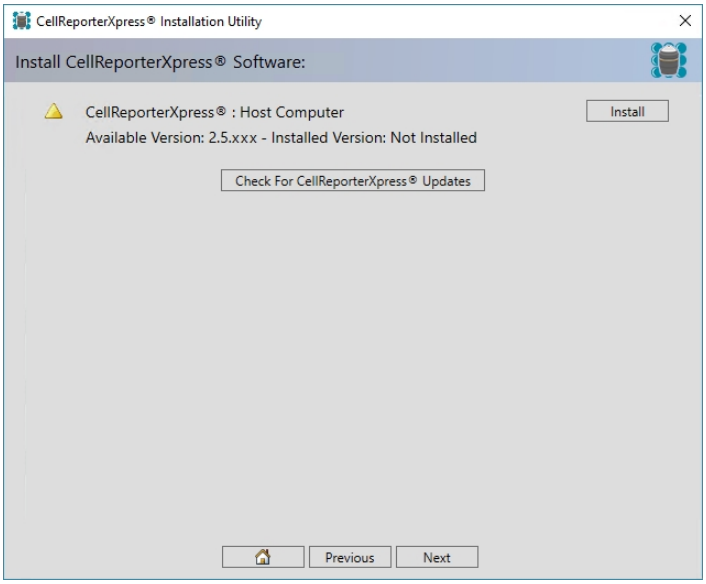
    - If you do not have a license file and you are not connected to the Internet, use another computer that has an Internet connection to obtain a license file from the CellReporterXpress License Download page:
      www.meta.moleculardevices.com/software/crx/authorize

      On the CellReporterXpress License Download page, enter your System ID and the registered email address and click **Download**. Save the file, and transfer it to the computer where you are installing the software. Then, on the **Install and Verify the CellReporterXpress License File** page, click **Install a License File** and browse to the location of the license file.

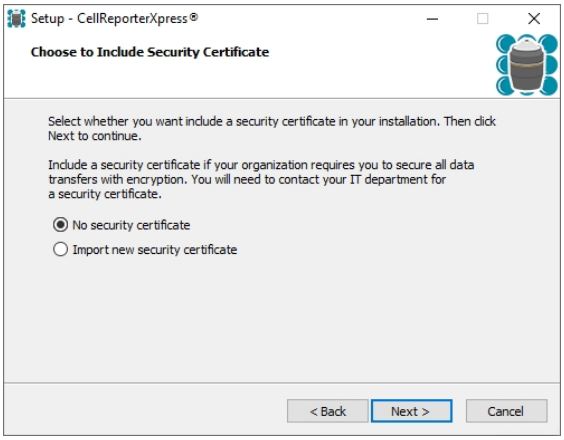


15. When all items are verified (indicated by a green ✓ symbol next to each item), click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

16. On the **Install CellReporterXpress Software** page, next to **CellReporterXpress: Host Computer**, click **Install**.



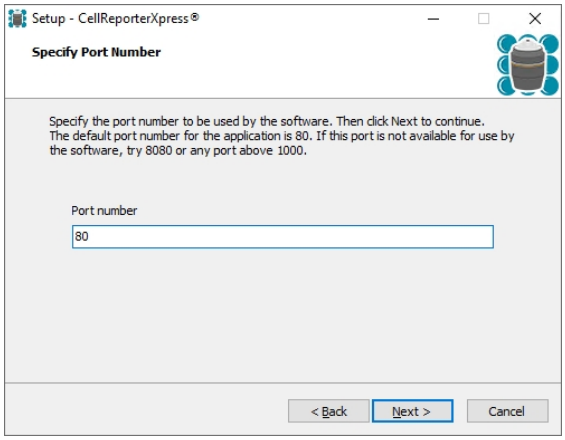
17. On the **Choose to Include Security Certificate** page, select the **No security certificate** option.



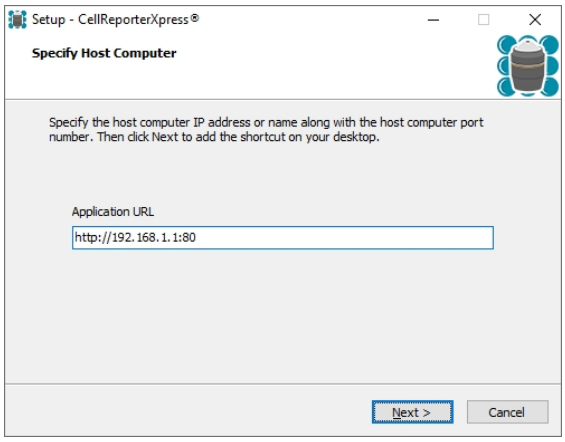
18. Click **Next**.

19. On the **Specify Port Number** page, enter the port number to be used by the software for communication with remote clients. The default port is 80.

> **Note:** If the default port is not available, enter 8080 or any port above 1000. You may want to contact your IT professional to determine the best port number.

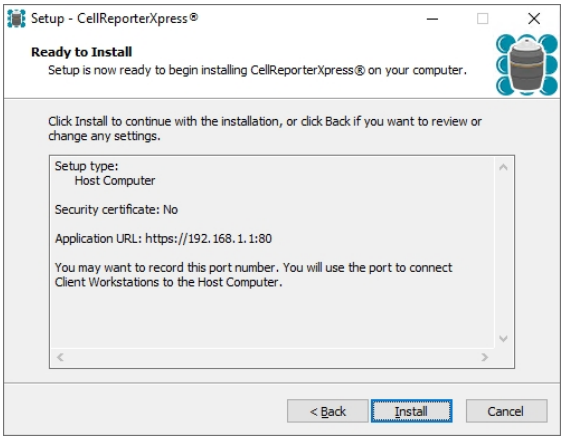


20. Click **Next**.
21. On the **Specify Host Computer** page, in the **Application URL** field, optionally replace the word `localhost` with the computer name or the IP address of the host computer along with the port number used by the host computer. For example, if the host computer name is **CellReporterXpress** and the IP address is **192.168.1.1** and the port used is **80**, the field should contain one of the following:
    - `http://localhost:80`
    - `http://CellReporterXpress:80`
    - `http://192.168.1.1:80`



22. Click **Next**.

23. On the **Ready to Install** page, click **Install**.



> **Tip:** You may want to record the Application URL, which you will use if you are connecting client workstations to the host computer.

24. When installation completes, click **Finish**.
25. On the **Install CellReporterXpress Software** page, click **Next**.
26. On the **Installation Summary** page, click **Exit**.
27. Do the following to restart the computer.
    a. In Windows, click **Start**, and select **Power**.
    b. Select **Restart**.
    c. Wait for the computer to restart and boot up.
28. If you are upgrading an existing installation of the software, do the following to clear the browser cache:
    a. Log in to the CellReporterXpress software. See Logging In to the Software on page 63 for details.
    b. Press **CTRL** + **F5** to clear the browser cache.

After you install a host computer, you must do the following:

- Customize the power plan and sleep settings to prevent the host computer from timing out during long experiments. See Customizing the Power Plan and Sleep Settings on page 60 for details.
- Set the decimal separator, if needed. See Setting the Decimal Separator on page 61 for details.

Installing a Host Computer with a Security Certificate

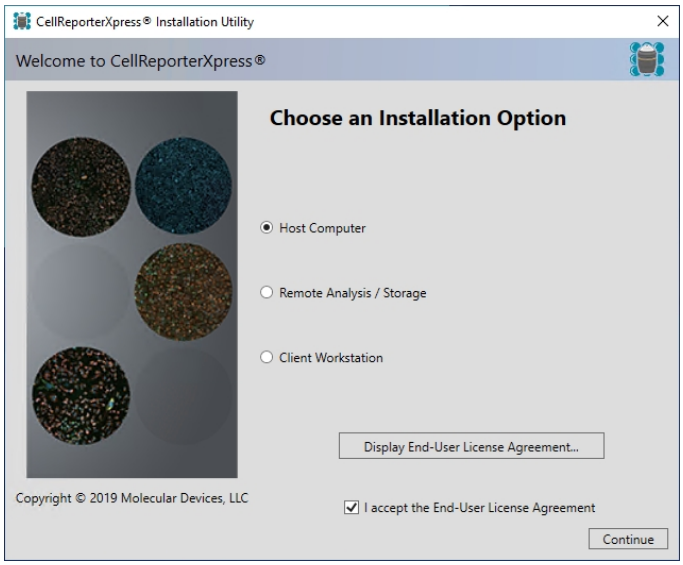
The host computer runs the core CellReporterXpress software services (MD.CoreService, MD.DataService, and MD.WebService), along with the services for analysis operations (MD.AnalysisService) and storage operations (MD.LocationService). The host computer communicates with the instrument, remote analysis computers, remote storage computers, and client workstations.

If your organization requires you to secure all data transfers with encryption, you can install the CellReporterXpress host computer with a security certificate. You will need to contact your IT professional for a security certificate file, which is a PFX file.

Note: If your organization does not require you to secure all data transfers with encryption, see Installing a Host Computer without a Security Certificate on page 32.

To install a host computer with a security certificate:

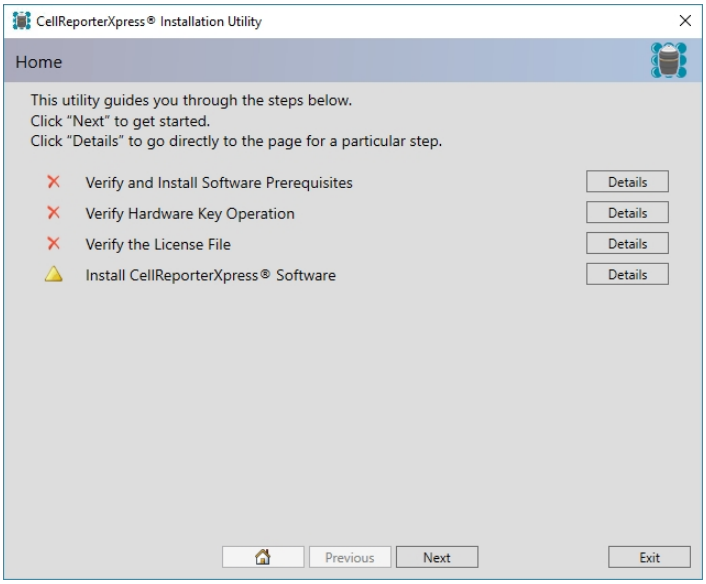
1. Browse to the location of the CellReporterXpress Installation Utility folder that you downloaded earlier.
2. Double-click the **CRX 2.5.xxx.zip** folder.
3. Right-click **setup.exe** and select **Run as administrator** to start the CellReporterXpress Installation Utility.



4. Select the **Host Computer** option.
5. Click **Display End-User License Agreement**.
6. Review the license agreement.
7. If you accept the license agreement, do the following:
   a. Select the **I accept the End-User License Agreement** check box.
   b. Click **Continue**.

Note: If you do not accept the license agreement, you cannot install the software.

The **Home** page summarizes the CellReporterXpress installation steps.



8. Click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

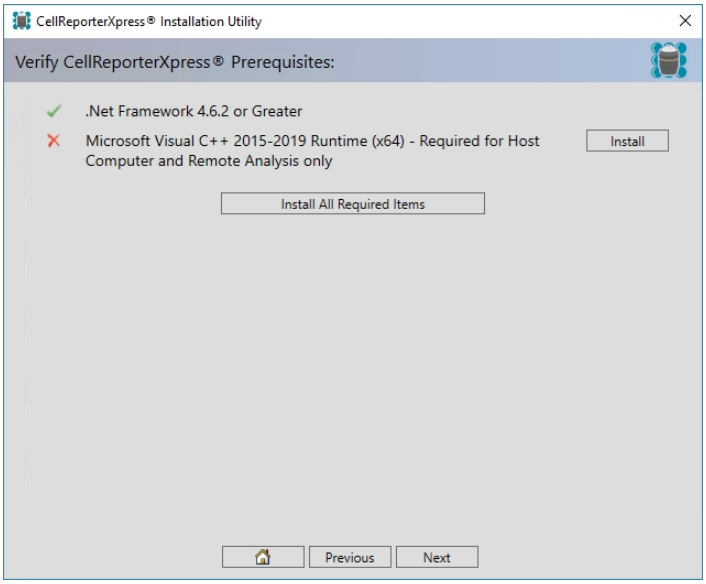
Note: You can also navigate to a specific installation step by clicking **Details** for that step.

The CellReporterXpress host computer requires that the following software be installed:

- Microsoft .NET Framework 4.6.2 or later
- One of the following:
  - Microsoft Visual C++ 2015 Runtime (x64)
  - Microsoft Visual C++ 2017 Runtime (x64)
  - Microsoft Visual C++ 2019 Runtime (x64)
- Google Chrome

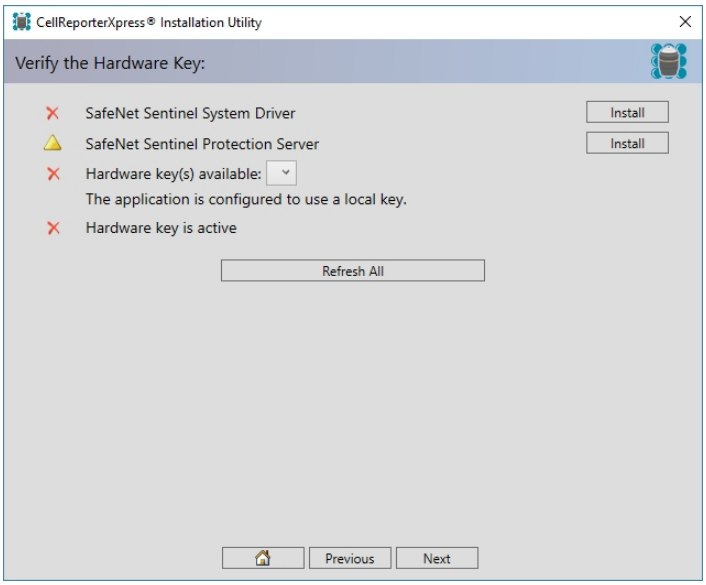
Note:

- .NET Framework 4.6.2 or later is installed with all recent versions of Windows 10. To check which version of .NET Framework is installed, go to docs.microsoft.com/en-us/dotnet/framework/migration-guide/how-to-determine-which-versions-are-installed.
- The CellReporterXpress Installation Utility does not install Google Chrome. If Chrome is not installed, go to www.google.com/chrome/browser to download and install Chrome before continuing to install the CellReporterXpress software.



9. For any prerequisite that is not met (indicated by a red ✕ symbol next to the item), do the following:
   a. Click **Install** to install specific prerequisites.
   b. Follow the on-screen instructions to install the prerequisite.
10. When all prerequisites are installed (indicated by a green ✓ symbol next to each item), click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

11. Remove the hardware key from its case and insert it in a USB port on the host computer.
12. If the SafeNet Sentinel software is not installed (indicated by a red ✕ symbol next to the item), do the following:
    a. If needed, on the **Verify the Hardware Key** page, next to **SafeNet Sentinel System Driver**, click **Install**.
    b. Follow the on-screen instructions to install the driver.
    c. After the driver is installed, click **Refresh All**.



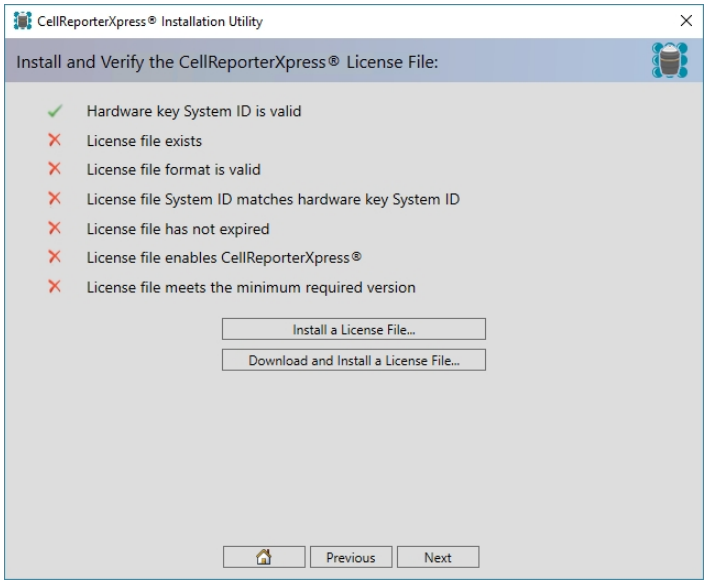
13. When all items are verified (indicated by a green ✓ symbol next to each item), click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

14. On the **Install and Verify the CellReporterXpress License File** page, do one of the following:
    - If you have a license file, click **Install a License File** and browse to the location of your license file.
    - If you do not have a license file and you are connected to the Internet, click **Download and Install a License File**, then enter the registered email address and click **OK**.

      Note: You must use the email address registered with Molecular Devices. You can find the registered email on the welcome letter inside the hardware key case. If you do not know the registered email address, contact Molecular Devices Technical Support. See Obtaining Support on page 7 for details.

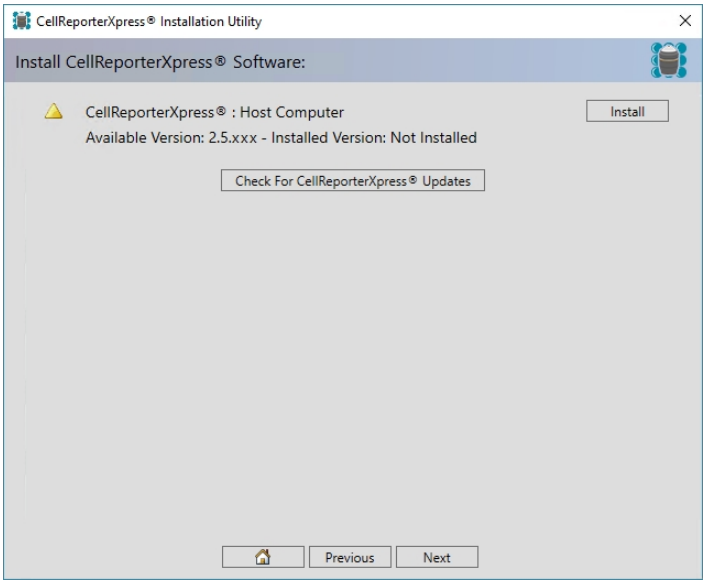
    - If you do not have a license file and you are not connected to the Internet, use another computer that has an Internet connection to obtain a license file from the CellReporterXpress License Download page:
      www.meta.moleculardevices.com/software/crx/authorize

      On the CellReporterXpress License Download page, enter your System ID and the registered email address and click **Download**. Save the file, and transfer it to the computer where you are installing the software. Then, on the **Install and Verify the CellReporterXpress License File** page, click **Install a License File** and browse to the location of the license file.

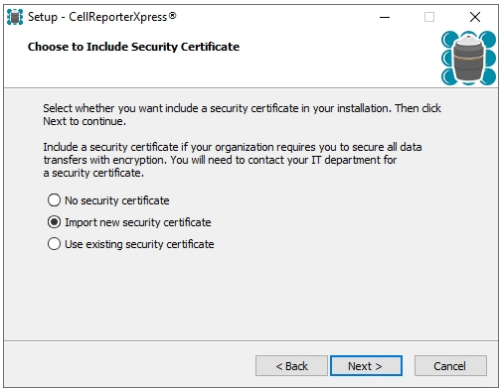


15. When all items are verified (indicated by a green ✓ symbol next to each item), click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

16. On the **Install CellReporterXpress Software** page, next to **CellReporterXpress: Host Computer**, click **Install**.

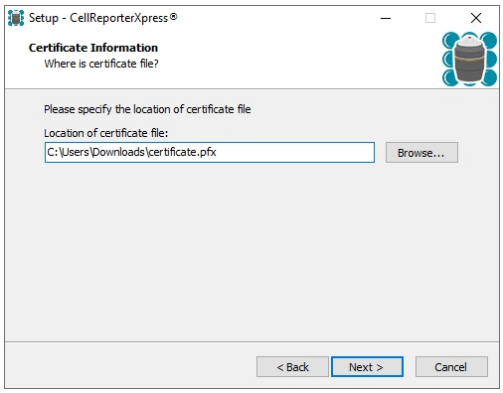


17. On the **Choose to Include Security Certificate** page, do one of the following:
    a. If you are installing with this security certificate for the first time, select the **Import new security certificate** option.
    b. If you are updating an existing security certificate, select the **Use existing security certificate** option.



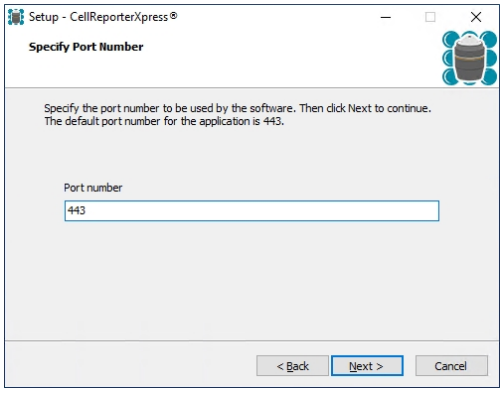
18. Click **Next**.

19. On the first **Certificate Information** page, browse to the location of the security certificate (PFX file) that you received from your IT professional.



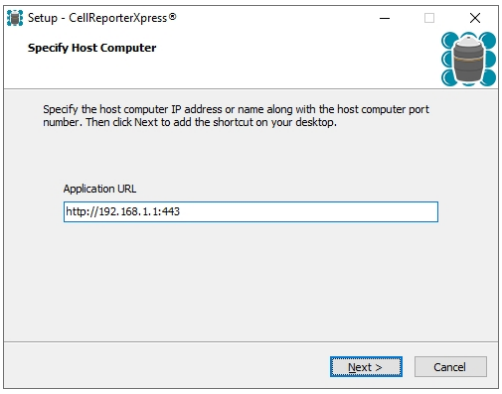
20. Click **Next**.
21. On the second **Certificate Information** page, in the **Password** field, enter the password for the security certificate.
22. In the **Confirm Password** field, enter the password for the security certificate again.
23. Click **Next**.
24. On the **Specify Port Number** page, enter the port number to be used by the software for communication with remote clients. The default port is 443.

Note: If the default port is not available, contact your IT professional to determine the best port number.

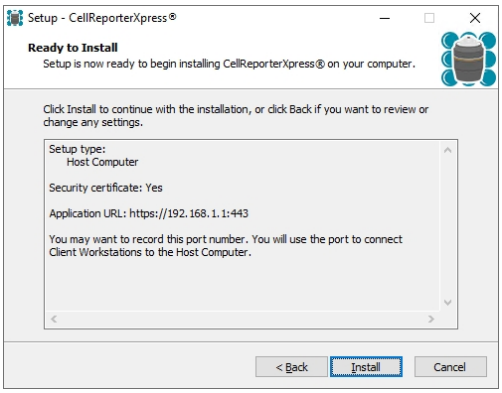


25. Click **Next**.

26. On the **Specify Host Computer** page, in the **Application URL** field, optionally replace the word `localhost` with the computer name or the IP address of the host computer along with the port number used by the host computer. For example, if the host computer name is **CellReporterXpress** and the IP address is **192.168.1.1** and the port used is **443**, the field should contain one of the following:
    - `http://localhost:443`
    - `http://CellReporterXpress:443`
    - `http://192.168.1.1:443`



27. Click **Next**.
28. On the **Ready to Install** page, click **Install**.



29. When installation completes, click **Finish**.
30. On the **Install CellReporterXpress Software** page, click **Next**.
31. On the **Installation Summary** page, click **Exit**.

32. Do the following to restart the computer.
    a. In Windows, click **Start**, and select **Power**.
    b. Select **Restart**.
    c. Wait for the computer to restart and boot up.
33. If you are upgrading an existing installation of the software, do the following to clear the browser cache:
    a. Log in to the CellReporterXpress software. See Logging In to the Software on page 63 for details.
    b. Press **CTRL** + **F5** to clear the browser cache.

After you install a host computer, you must do the following:

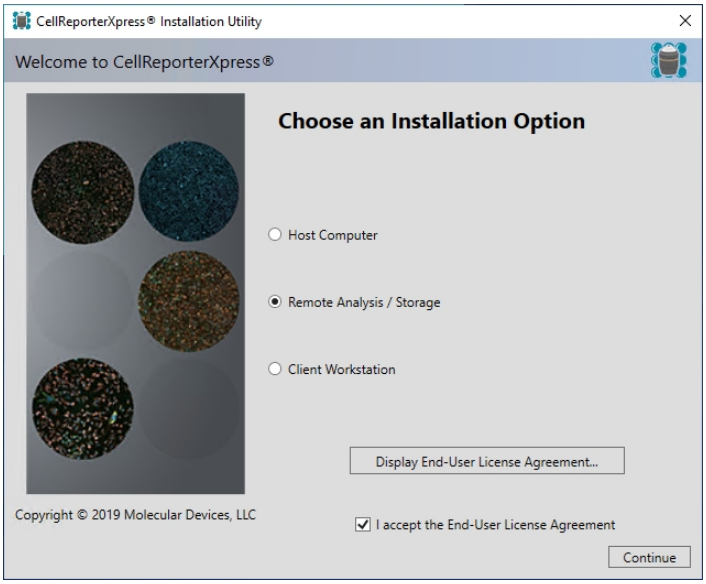
- Customize the power plan and sleep settings to prevent the computer from timing out during long experiments. See Customizing the Power Plan and Sleep Settings on page 60 for details.
- Set the decimal separator, if needed. See Setting the Decimal Separator on page 61 for details.

Installing a Remote Analysis Computer

In a server configuration, analysis operations are performed by the host computer and any remote computer running the Analysis Service (MD.LocationService). While the CellReporterXpress software license limits the number of analysis processes running concurrently, there is no limit to the number of computers running analysis operations. When you set up multiple computers for analysis operations, the CellReporterXpress software determines which computers perform analysis.

To install a remote analysis computer:

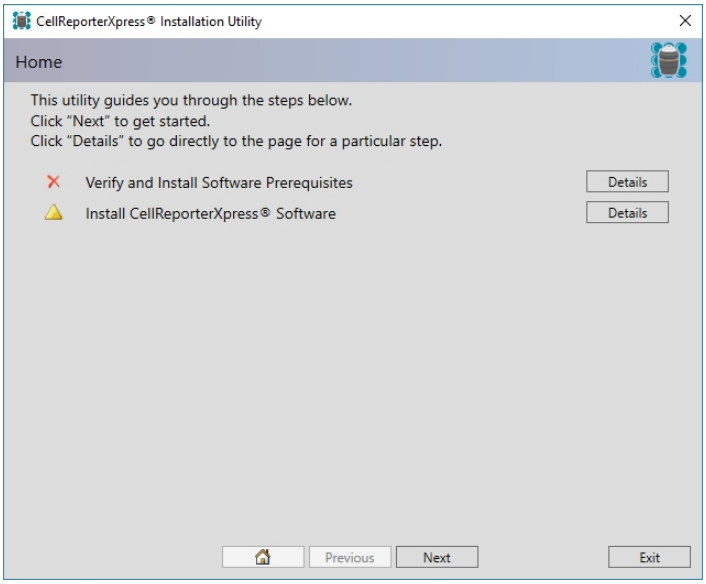
1. Browse to the location of the CellReporterXpress Installation Utility folder that you downloaded earlier.
2. Double-click the **CRX 2.5.xxx.zip** folder.
3. Right-click **setup.exe** and select **Run as administrator** to start the CellReporterXpress Installation Utility.



4. Select the **Remote Analysis/Storage** option.
5. Click **Display End-User License Agreement**.
6. Review the license agreement.
7. If you accept the license agreement, do the following:
   a. Select the **I accept the End-User License Agreement** check box.
   b. Click **Continue**.

Note: If you do not accept the license agreement, you cannot install the software.

The **Home** page summarizes the CellReporterXpress installation steps.



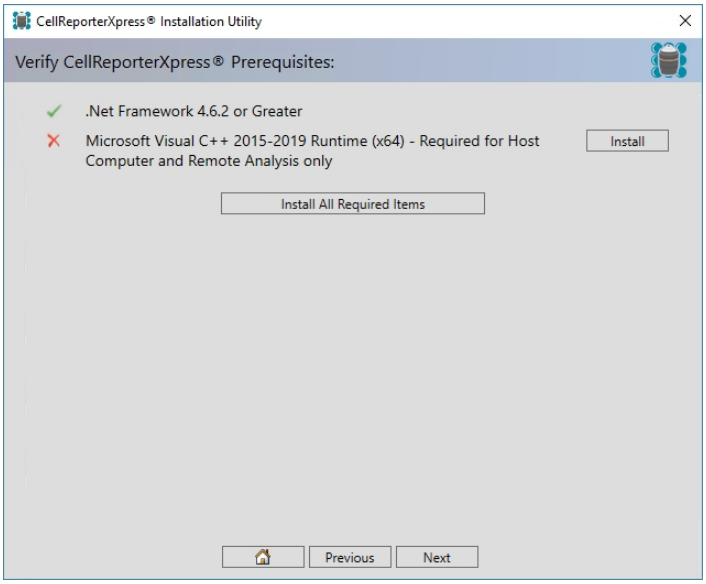
8. Click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

Note: You can also navigate to a specific installation step by clicking **Details** for that step.

The CellReporterXpress remote analysis computer requires that the following software be installed:

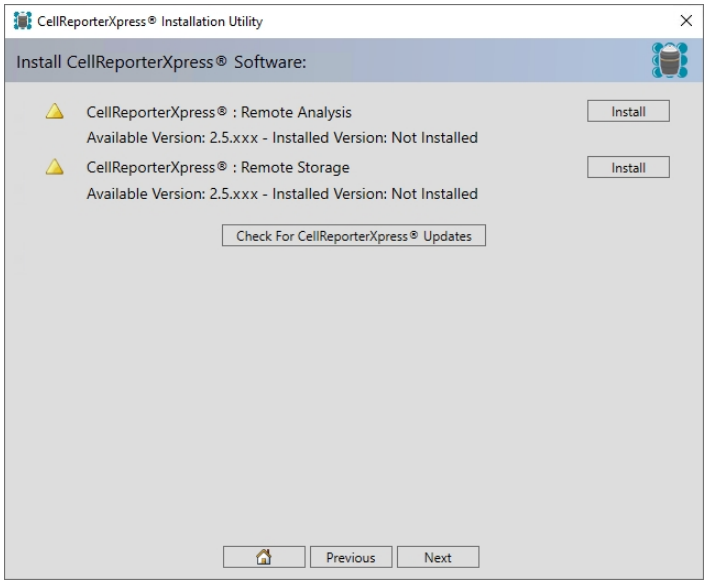
- Microsoft .NET Framework 4.6.2 or later
- One of the following:
  - Microsoft Visual C++ 2015 Runtime (x64)
  - Microsoft Visual C++ 2017 Runtime (x64)
  - Microsoft Visual C++ 2019 Runtime (x64)

Note: .NET Framework 4.6.2 or later is installed with all recent versions of Windows 10, so it is likely this requirement is met. To check which version of .NET Framework is installed, go to docs.microsoft.com/en-us/dotnet/framework/migration-guide/how-to-determine-which-versions-are-installed.



9. For any prerequisite that is not met (indicated by a red ✕ symbol next to the item), do the following:
   a. Click **Install** to install specific prerequisites.
   b. Follow the on-screen instructions to install the prerequisite.
10. When all prerequisites are installed (indicated by a green ✓ symbol next to each item), click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

11. On the **Install CellReporterXpress Software** page, next to **CellReporterXpress: Remote Analysis**, click **Install**.



12. When installation completes, click **Next**.
13. On the **Installation Summary** page, click **Exit**.
14. Do the following to restart the computer.
    a. In Windows, click **Start**, and select **Power**.
    b. Select **Restart**.
    c. Wait for the computer to restart and boot up.

After you install a remote analysis computer, you must do the following:

- Customize the power plan and sleep settings to prevent the computer from timing out during long experiments. See Customizing the Power Plan and Sleep Settings on page 60 for details.
- Set the decimal separator, if needed. See Setting the Decimal Separator on page 61 for details.
- Open the required ports to enable communication between the host computer and remote analysis computers. See Firewalls and Ports on page 24 for details.
- Register the computer for image analysis. See Registering a Remote Analysis Computer on page 70 for details.

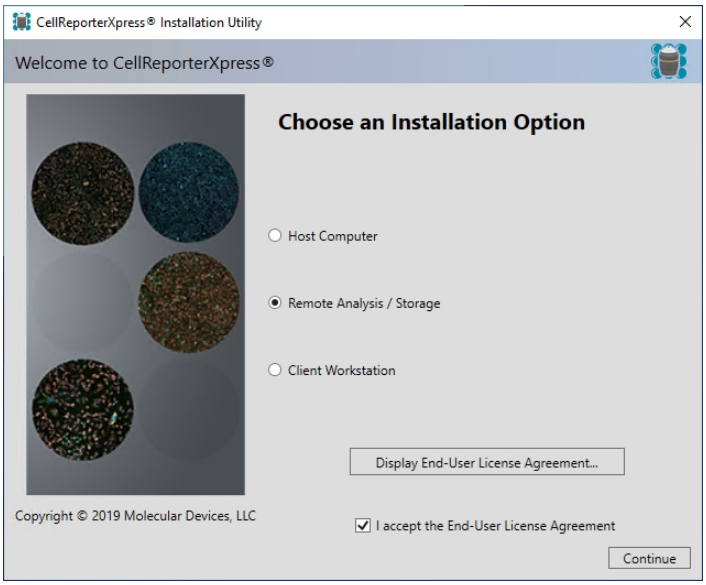
Installing a Remote Storage Computer

In a server configuration, storage operations are performed by the host computer and any remote computer running the Location Service (MD.LocationService). There is no limit to the number of remote storage computers in the configuration. Each remote storage computer contains one or more folders mapped for storage.

Tip: If the CellReporterXpress software will be used by multiple groups, you may want to organize storage by group.

To install a remote storage computer:

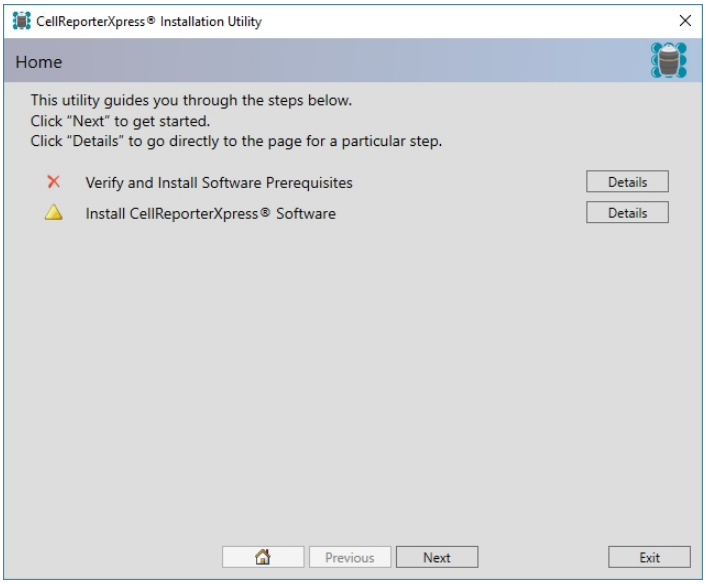
1. Browse to the location of the CellReporterXpress Installation Utility folder that you downloaded earlier.
2. Double-click the **CRX 2.5.xxx.zip** folder.
3. Right-click **setup.exe** and select **Run as administrator** to start the CellReporterXpress Installation Utility.



4. Select the **Remote Analysis/Storage** option.
5. Click **Display End-User License Agreement**.
6. Review the license agreement.
7. If you accept the license agreement, do the following:
   a. Select the **I accept the End-User License Agreement** check box.
   b. Click **Continue**.

Note: If you do not accept the license agreement, you cannot install the software.

The **Home** page summarizes the CellReporterXpress installation steps.



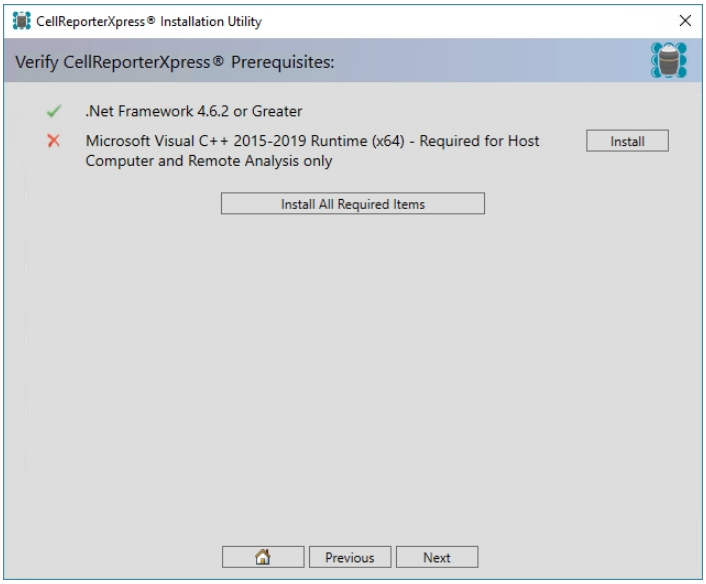
8. Click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

Note: You can also navigate to a specific installation step by clicking **Details** for that step.

The CellReporterXpress remote storage computer requires that Microsoft .NET Framework 4.6.2 or later be installed.

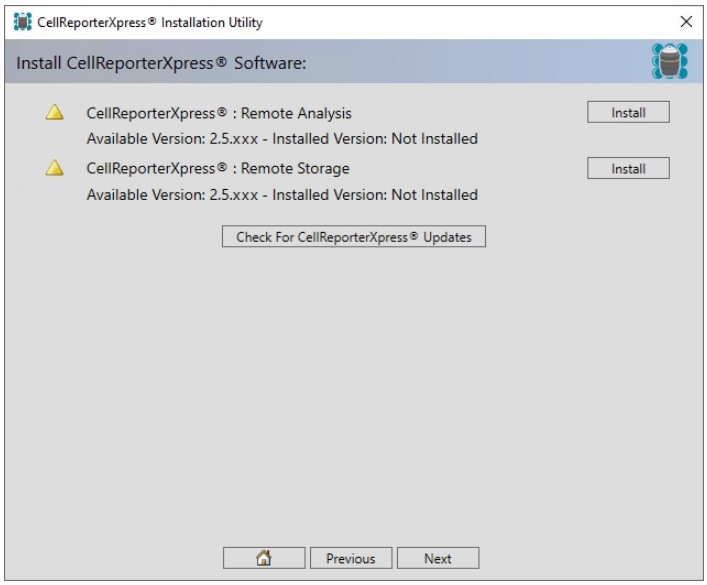
Note:

- .NET Framework 4.6.2 or later is installed with all recent versions of Windows 10, so it is likely this requirement is met. To check which version of .NET Framework is installed, go to docs.microsoft.com/en-us/dotnet/framework/migration-guide/how-to-determine-which-versions-are-installed.
- Microsoft C++ Runtime (x64) is not required for a remote storage computer.



9. For any prerequisite that is not met (indicated by a red ✕ symbol next to the item), do the following:
   a. Click **Install** to install specific prerequisites.
   b. Follow the on-screen instructions to install the prerequisite.
10. When all prerequisites are installed (indicated by a green ✓ symbol next to each item), click **Next** to continue to the next page of the CellReporterXpress Installation Utility.

11. On the **Install CellReporterXpress Software** page, next to **CellReporterXpress: Remote Storage**, click **Install**.



12. When installation completes, click **Next**.
13. On the **Installation Summary** page, click **Exit**.
14. Do the following to restart the computer.
    a. In Windows, click **Start**, and select **Power**.
    b. Select **Restart**.
    c. Wait for the computer to restart and boot up.

After you install a remote storage computer, you must do the following:

- Customize the power plan and sleep settings to prevent the computer from timing out during long experiments. See Customizing the Power Plan and Sleep Settings on page 60 for details.
- Set the decimal separator, if needed. See Setting the Decimal Separator on page 61 for details.
- Open the required ports to enable communication between the host computer and external analysis computers. See Firewalls and Ports on page 24 for details.
- Register the computer for remote storage. See Registering a Remote Storage Computer on page 71 for details.

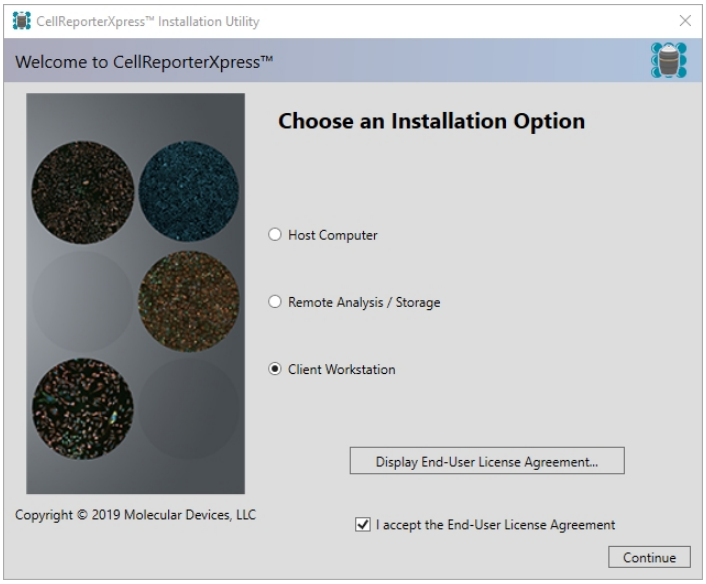
Installing a Client Workstation

In a network configuration and server configuration, you can set up computers and tablets as client workstations to connect to the host computer. A client workstation uses a supported browser to display the CellReporterXpress software user interface and interact with the software. For a Windows computer using Google Chrome, you can install a shortcut that enables easy access the CellReporterXpress software.

Note: No installation steps are required for client workstation on a tablet, a non-Windows computers, or a computer without Google Chrome. Any client workstation can connect to the host computer using a supported browser. See Logging In to the Software on page 63 for details.

To install a client workstation:

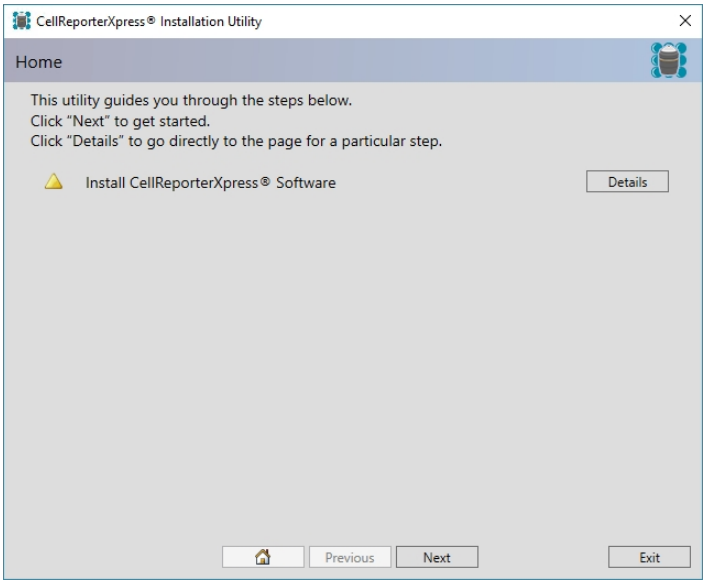
1. Browse to the location of the CellReporterXpress Installation Utility folder that you downloaded earlier.
2. Double-click the **CRX 2.5.xxx.zip** folder.
3. Right-click **setup.exe** and select **Run as administrator** to start the CellReporterXpress Installation Utility.



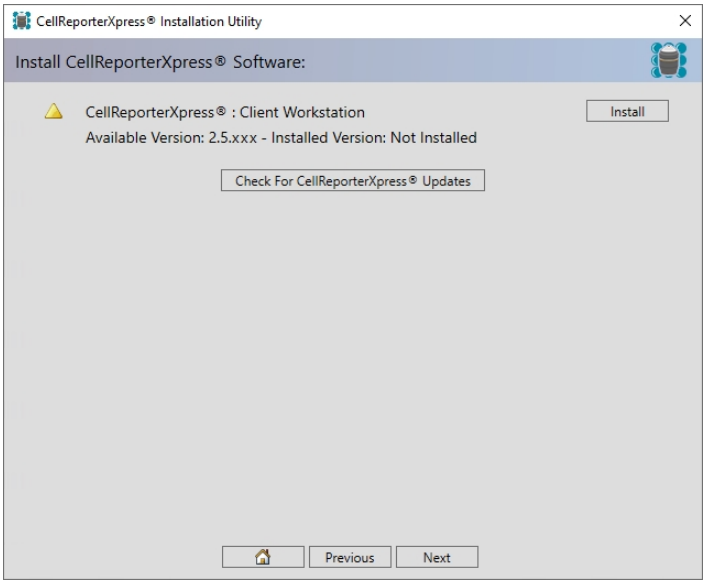
4. Select the **Client Workstation** option.
5. Click **Display End-User License Agreement**.
6. Review the license agreement.
7. If you accept the license agreement, do the following:
   a. Select the **I accept the End-User License Agreement** check box.
   b. Click **Continue**.

Note: If you do not accept the license agreement, you cannot install the software.

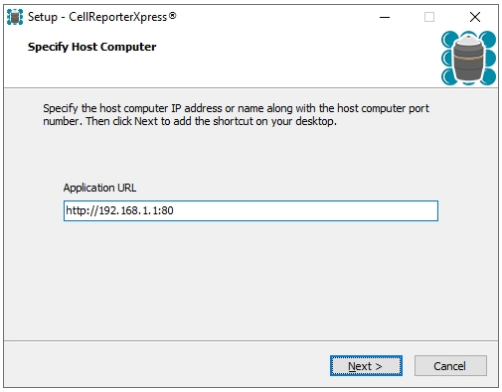
The **Home** page summarizes the CellReporterXpress installation steps.



8. Click **Next** to continue to the next page of the CellReporterXpress Installation Utility.
9. On the **Install CellReporterXpress Software** page, next to **CellReporterXpress: Client Workstation**, click **Install**.



10. On the **Specify Host Computer** page, in the **Application URL** field, replace the word `localhost` with the computer name or the IP address of the host computer along with the port number used by the host computer (which is likely 80 without a security certificate and 443 with a security certificate). For example, if your host computer name is **CellReporterXpress** and the IP address is **192.168.1.1**, the field should contain one of the following:
    - `http://CellReporterXpress`
    - `http://192.168.1.1`



11. Click **Next**.
12. On the **Ready to Install** page, click **Install**.
13. When installation completes, click **Finish**.
14. On the **Install CellReporterXpress Software** page, click **Next**.
15. On the **Installation Summary** page, click **Exit**.
16. Do the following to restart the computer.
    a. In Windows, click **Start**, and select **Power**.
    b. Select **Restart**.
    c. Wait for the computer to restart and boot up.
17. If you are upgrading an existing installation of the software, do the following to clear the browser cache:
    a. Log in to the CellReporterXpress software. See Logging In to the Software on page 63 for details.
    b. Press **CTRL** + **F5** to clear the browser cache.

Customizing the Power Plan and Sleep Settings

It is possible that computers running a CellReporterXpress software service may time out during long experiments, particularly those that include time-series acquisitions. You can minimize these errors by customizing the power plan and sleep settings for all computers running a CellReporterXpress software service (that is, the host computer and any remote storage and remote analysis computers in the configuration).

To customize the power plan and sleep settings for the CellReporterXpress software:

1. In Windows, right-click **Start**, and select **Power Options**.
2. On the right, click **Additional Power Settings**.
3. Select the **High Performance** option.
4. Next to the **High Performance** option, click **Change Plan Settings**.
5. In the **Edit Plan Settings** dialog, do the following:
   a. Under **Plugged In**, click the **Turn Off the Display** drop-down list box, and select **Never**.
   b. Click the **Put the Computer to Sleep** drop-down list box, and select **Never**.
   c. Click **Change Advanced Power Settings**.
   d. In the **Hard Disk** > **Turn Off Hard Disk After** > **Plugged In** field, enter **Never**.
   e. In the **Sleep** > **Hibernate After** > **Plugged In** field, enter **Never**.
   f. Click **OK**.
   g. Click **Save Changes**.
   h. Close the **Edit Plan Settings** dialog.
6. Close the **Settings** dialog.
7. If the host computer uses a wireless connection, do the following:

   Note: If the host computer does not use a wireless connection, skip this step.

   a. Right-click **Start**, and select **Device Manager**.
   b. Under **Network Adapters**, double-click the wireless adapter.
   c. Click the **Power Management** tab.
   d. Deselect the **Allow the Computer to Turn Off This Device to Save Power** check box.
   e. Click **OK**.

Setting the Decimal Separator

The CellReporterXpress software requires that the Region settings use a period as the decimal separator. Many European countries use a comma as a decimal separator. If the Region settings on the computers in your configuration use something other than a period as the decimal separator, you must change the setting accordingly.

To set the decimal separator to use a period:

1. In Windows, right-click **Start**, and select **Settings**.
2. Click **Time & Language**.
3. On the right, click **Additional Date, Time, & Regional Settings**.
4. Click **Change Date, Time, or Number Formats**.
5. Click **Additional Settings**.
6. Click the **Decimal Symbol** drop-down list box, and select **.** (period).
7. Change any other settings as needed. For example, you may want to change the value in the **Digit Grouping Symbol** field, so it will not be confused with the decimal separator.
8. Click **OK**.
9. Click the **Administrative** tab.
10. In the **Welcome Screen and New User Accounts** section, click **Copy Settings**.
11. Click **Apply**.
12. Select the **Welcome Screen and System Accounts** check box.
13. Click **OK**.
14. Click **OK**.

Chapter 5: Other Installation Tasks

After you have installed the CellReporterXpress software, you may need to set up other components. This section contains the following topics:

- Logging In to the Software, see below
- Registering an Instrument, see page 66
- Registering a Remote Analysis Computer, see page 70
- Registering a Remote Storage Computer, see page 71
- Configuring the Location Service to Use a Network Drive for Storage, see page 74
- Mapping a Folder for Storage, see page 77

Logging In to the Software

This section describes the various ways to log in to the CellReporterXpress software:

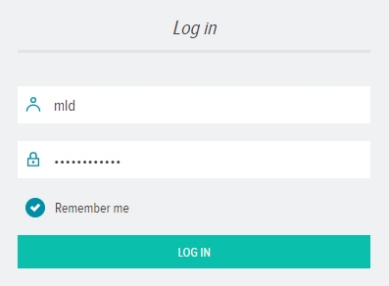
- Logging In on the Host Computer, see page 64
- Logging In on a Client Workstation Using a Shortcut, see page 64
- Logging In on a Client Workstation Using Connection Details, see page 65

Note: The CellReporterXpress software uses the Windows login credentials of the host computer to authenticate users. If the host computer does not maintain a constant connection to the network, Molecular Devices recommends that user accounts be Local accounts (and not Roaming or Domain accounts). If Domain accounts are required, the Host computer should remain connected to the domain network at all times.

Logging In on the Host Computer

To log in to the CellReporterXpress software on the host computer:

1. On the host computer, do one of the following to display the CellReporterXpress Log In screen:
   - On the desktop, double-click **MD.CellReporterXpress**.
   - Click **Start > Molecular Devices > MD.CellReporterXpress**.



2. In the **Login** field, enter the user name for a Windows account on the host computer.
3. In the **Password** field, enter the required password.

> **Note:** A password is required to log in to the CellReporterXpress software. If the Windows account has no password, you cannot log in to the software.

4. Click **LOG IN**.

Logging In on a Client Workstation Using a Shortcut

If you installed a client workstation, you can use the installed shortcut to connect to the CellReporterXpress software on the host computer.

To log in to the CellReporterXpress software from a client workstation with a shortcut:

1. On the client workstation, do one of the following to display the CellReporterXpress Log In screen:
   - On the desktop, double-click **MD.CellReporterXpress**.
   - Click **Start > Molecular Devices > MD.CellReporterXpress**.
2. In the **Login** field, enter the user name for a Windows account on the host computer.
3. In the **Password** field, enter the required password.

> **Note:** A password is required to log in to the CellReporterXpress software. If the Windows account has no password, you cannot log in to the software.

4. Click **LOG IN**.

Logging In on a Client Workstation Using Connection Details

You can enter the connection details to connect a computer or tablet to the CellReporterXpress software on the host computer.

Note: If you are logging in on a client workstation for the first time after an update, Molecular Devices recommends that you restart the computer or tablet and clear the browser cache before connecting to the software on the host computer.

To log in to the CellReporterXpress software from a client workstation using connection details:

1. On the computer or tablet, open a supported browser.
2. In the address bar, enter either the IP address or the host computer name along with the port being used by the remote client (by default, 80) in the following format:

   ```
   http://address:port
   ```

   For example, if the host computer is named CellReporterXpress, enter:

   ```
   http://CellReporterXpress:80
   ```

   Or, if the IP address of the host computer is 192.168.1.1, enter:

   ```
   http://192.168.1.1:80
   ```

3. In the **Login** field, enter the user name for a Windows account on the host computer.
4. In the **Password** field, enter the required password.

   Note: A password is required to log in to the CellReporterXpress software. If the Windows account has no password, you cannot log in to the software.

5. Click **LOG IN**.

Registering an Instrument

You can register an instrument in the software on the **Devices** page in **Configuration** mode. Registered instruments use one of the following connections:

- **Direct Connection**: A direct Ethernet connection between the instrument and the host computer running the CellReporterXpress software in a standalone configuration.
- **Remote Connection**: A network Ethernet connection between the instrument and the host computer running the CellReporterXpress software in a network configuration or a server configuration.

The **Devices** page contains two tabs:

- **My Devices**: Lists all registered instruments available to you for acquisition and maintenance.
- **Add Device**: Lists all registered instruments available to the software. From here, you can add devices to the list on the **My Devices** tab, which makes them available to you for acquisition and maintenance.

You must add at least one instrument to the list on the **My Devices** tab to acquire an image.

For each instrument, a status indicator shows one of the following:

Online

Offline or **Incompatible**

Busy

Error

Note: If the status indicator for an instrument shows **Incompatible**, the instrument firmware version may not be compatible with the software version. See the Molecular Devices Knowledge Base for details on updating the firmware.

Registering a Directly Connected Instrument

To register a directly connected instrument:

1. Confirm that the instrument is connected to the host computer running the CellReporterXpress software using the **LAN1** port on the back of the device.
2. From the CellReporterXpress **Home** page, click the **Configuration** tile.
3. On the left side of the screen, click **Devices**.
4. On the **Devices** page, on the **Add Device** tab, click **Connect LAN1**.

The instrument appears in the list on the **Add Device** tab.

Tip: Molecular Devices recommends that you do not directly connect an instrument to the host computer using the LAN2 port unless advised to do so by Molecular Devices Technical Support.

Registering a Remotely Connected Instrument Using Autodiscovery

To register a remotely connected instrument using autodiscovery:

1. Confirm that the instrument is connected to the network using the **LAN2** port on the back of the device.
2. Confirm that the host computer running the CellReporterXpress software is connected to the network.
3. From the CellReporterXpress **Home** page, click the **Configuration** tile.
4. On the left side of the screen, click **Devices**.

Within five minutes, the instrument appears in the list on the **Add Device** tab. It may initially indicate offline status, but it should change to online status shortly after it appears.

If the instrument does not appear in the list on the **Add Device** tab, your computer or your network may be set up to block autodiscovery. In this case, do one of the following:

- Enable network discovery on the computer where the CellReporterXpress software is installed and try again.
- Register the instrument using manual discovery. See Registering a Remotely Connected Instrument Using Manual Discovery on page 69 for details.

Registering a Remotely Connected Instrument Using Manual Discovery

Your computer or your network may be set up to block autodiscovery. In that case, you can register a remotely connected instrument using manual discovery.

To register a remotely connected instrument using manual discovery:

1. Confirm that the instrument is connected to the network using the **LAN2** port on the back of the device.
2. Confirm that the host computer running the CellReporterXpress software is connected to the network.
3. From the CellReporterXpress **Home** page, click the **Configuration** tile.
4. On the left side of the screen, click **Devices**.
5. On the **Devices** page, on the **Add Device** tab, in the **Remote Connection** field, enter the name or the IP address of the instrument you want to add.

   Note: The instrument name begins with "IXP-" followed by the serial number, which is on the back of the instrument. See the *ImageXpress Pico User Guide* for details on locating the serial number.

   The device IP address is determined by your network. Contact your network administrator for details.

6. Click **Register Device**.

The remotely connected instrument appears in the list on the **Add Device** tab.

If the instrument does not appear in the list on the **Add Device** tab, contact your network administrator.

Registering a Remote Analysis Computer

You can register computers on the network for remote image analysis from the CellReporterXpress software.

In a server configuration, any registered computer running the Analysis Service (MD.AnalysisService) can perform image analysis.

All registered computers appear in the Registered Image Analysis Computers list with one of the following status indicators:

Online

Offline

A registered computer may indicate offline status due to an issue with the network, the firewall, or the Analysis Service (that is, it is not present or not started).

To register a computer for image analysis:

1. From the CellReporterXpress **Home** page, click the **Configuration** tile.
2. On the left side of the screen, click **Image Analysis Services**.
3. On the **Image Analysis Computers** page, in the **Add Image Analysis Computer** field, enter the PC name or the IP address of the computer you want to register.
4. Click **Add Image Analysis Computer**.

The computer appears in the **Registered Image Analysis Computers** list.

Registering a Remote Storage Computer

After installing a remote storage computer, you must register it in the CellReporterXpress software. In a server configuration, any computer running the Location Service (MD.LocationService) can be registered for storage.

Tip: If the CellReporterXpress software will be used by multiple groups, you may want to organize storage by group.

All registered computers appear in the List of Registered Storage Computers and all mapped folders appear in the List of Mapped Folders with one of the following status indicators:

Online

Offline

A registered computer or mapped folder may indicate offline status due to an issue with the network, the firewall, or the Location Service (that is, it is not present or not started).

Registering a Remote Storage Computer

To register a computer for storage:

1. From the CellReporterXpress **Home** page, click the **Configuration** tile.
2. On the left side of the screen, click **Data Storage**.
3. On the **Data Storage** page, in the **Add Data Storage Computer** field, enter the PC name or the IP address of the computer you want to register.
4. Click **Add Data Storage**.

The computer appears in the **List of Registered Storage Computers**.

On the host computer and on any computer registered for remote storage, the following folder is created and mapped for storage by default:

```
C:\ProgramData\Molecular Devices\MD.LocationService\Data
```

You can map other folders for storage as needed. See Mapping a Folder for Storage on page 77 for details.

Note: To increase security for remote storage, you may want to set the Location Service (MD.LocationService) as a local service on each remote storage computer. Once you do this, you must set each folder mapped for storage to allow write access to the software. See Secure Setup for Remote Storage on page 72 for details.

Secure Setup for Remote Storage

To increase security for remote storage, you may want to set the Location Service (MD.LocationService) as a local service on each remote storage computer. Once you do this, you must set each folder mapped for storage to allow write access to the software.

Setting the Location Service as a Local Service

Set each Location Service in your configuration as a local service. The Location Service is installed on the host computer and on any remote computer registered for storage.

To set the Location Service as a local service:

1. Log in as a privileged user (such as admin or power user) to the computer that contains the Location Service.
2. In Windows, right-click **Start**, and select **Computer Management**.
3. In the left pane, expand **Services and Applications**.
4. Click **Services**.
5. In the list of services, double-click **MD.LocationService**.
6. Click the **Log On** tab.
7. Select the **This Account** option.
8. Click **Browse**.
9. In the **Enter The Object Name To Select** list, enter `Local Service`.

   Note: Be sure to enter a space between the words.

10. Click **Check Names**.
    The text you entered changes to **LOCAL SERVICE**.
11. Click **OK**.
12. In the **Password** field and the **Confirm Password** field, clear the masked passwords.
13. Click **OK**.
14. Click **OK**.
15. Click **OK**.
16. In the list of services, right-click **MD.LocationService** and select **Restart**.
17. Repeat these steps on each computer that contains the Location Service.

After setting the Location Service as a local, you must set all mapped folders to allow access to the software. See Setting a Mapped Folder to Allow Access to the Software on page 73 for details.

Setting a Mapped Folder to Allow Access to the Software

When you register a computer for storage, the following folder is created and mapped for storage by default:

```
C:\ProgramData\Molecular Devices\MD.LocationService\Data
```

This folder is already set to allow access to the software. You must set all other mapped folders to allow access.

To set a mapped folder to allow access to the software:

1. In File Explorer, browse to the mapped folder.
2. Right-click the folder and select **Properties**.
3. Click the **Security** tab.
4. If **Authenticated Users** is not in the **Group or User Names** list, do the following:

   Note: If **Authenticated Users** is in the **Group or User Names** list, skip this procedure. The mapped folder is already set to allow access to the software.

   a. Click **Edit**.
   b. Click **Add**.
   c. In the **Enter The Object Names To Select** list, enter `Authenticated Users`.

      Note: Be sure to enter a space between the words.

   d. Click **Check Names**.
   e. Click **OK**.
   f. In the **Allow** column, select **Full Control**.
   g. Click **Apply**.
5. Click **OK**.
6. Repeat these steps for each mapped folder.

Configuring the Location Service to Use a Network Drive for Storage

By default, the Location Service (MD.LocationService) accesses only local drives for storage. If you want to use a network drive for storage, you can configure the Location Service to run as a user with the appropriate access.

Note: When specifying a folder on a network drive for storage, you must use the full, UNC path of the folder (for example, `\\servername\folder`). The software does not support using a virtual path that uses a drive letter (for example, `J:\folder`).

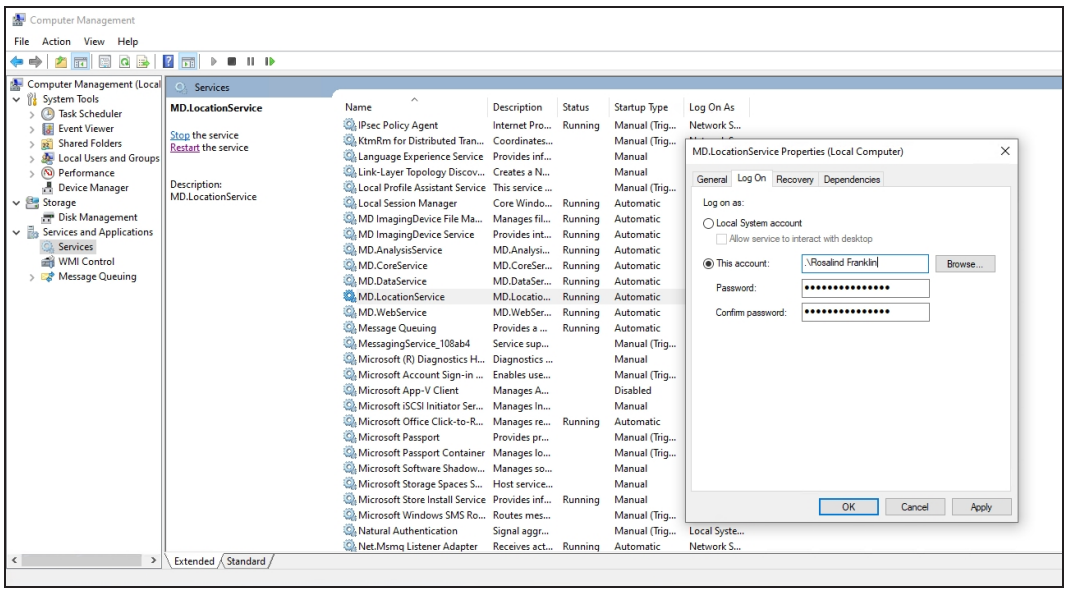
The Location Service typically runs as a local service, which does not have access to network locations. To access network locations, the service must run on the host computer as an existing user that has access to the network location.

Note: Use one of the following procedures according to your network type: either domain network or non-domain network.

Configuring the Location Service on a Domain Network

To configure the Location Service to use a network drive for storage on a domain network:

1. Log in as a privileged user (such as admin or power user) to the computer that contains the Location Service.
2. In Windows, right-click **Start**, and select **Computer Management**.
3. In the left pane, expand **Services and Applications**.
4. Click **Services**.
5. In the list of services, double-click **MD.LocationService**.
6. Click the **Log On** tab.



7. Select the **This Account** option.

8. Click **Browse**.
9. Click **Locations**.
10. Select the domain that contains the user that has access to the network location.
11. Click **OK**.
12. In the **Enter The Object Name To Select** list, enter the login for the user that has access to the network location.

    Note: In order to be found, this user must already be configured on the host computer.

13. Click **Check Names**.
    The text you entered changes to the fully qualified name of the user.
14. Click **OK**.
15. In the **Password** field and the **Confirm Password** field, enter the required password for the user.
16. Click **OK**.
17. Click **OK**.
18. In the list of services, right-click **MD.LocationService** and select **Restart**.

After configuring the Location Service to use a network drive for storage, you can map folders on that network drive to allow access to the software. See Mapping a Folder for Storage on page 77 for details.

Configuring the Location Service on a Non-Domain Network

To configure the Location Service to use a network drive for storage on a non-domain network:

1. Log in as a privileged user (such as admin or power user) to the computer that contains the Location Service.
2. In Windows, right-click **Start**, and select **Computer Management**.
3. In the left pane, expand **Services and Applications**.
4. Click **Services**.
5. In the list of services, double-click **MD.LocationService**.
6. Click the **Log On** tab.
7. Select the **This Account** option.
8. Click **Browse**.
9. In the **Enter The Object Name To Select** list, enter the login for the user that has access to the network location.

   Note: In order to be found, this user must already be configured on the host computer.

10. Click **Check Names**.
    The text you entered changes to the fully qualified name of the user.
11. Click **OK**.
12. In the **Password** field and the **Confirm Password** field, enter the required password for the user.
13. Click **OK**.
14. Click **OK**.
15. In the list of services, right-click **MD.LocationService** and select **Restart**.

After configuring the Location Service to use a network drive for storage, you can map folders on that network drive to allow access to the software. See Mapping a Folder for Storage on page 77 for details.

Mapping a Folder for Storage

On the host computer and on any computer registered for remote storage, the following folder is created and mapped for storage by default:

```
C:\ProgramData\Molecular Devices\MD.LocationService\Data
```

You can map other folders for storage as needed.

Note: Before you can map a folder on a network drive for storage, you must set up the Location Service accordingly. See Configuring the Location Service to Use a Network Drive for Storage on page 74 for details.

Tip: If the CellReporterXpress software will be used by multiple groups, you may want to organize storage by group.

To map a folder for storage:

1. From the CellReporterXpress **Home** page, click the **Configuration** tile.
2. On the left side of the screen, click **Data Storage**.
3. On the **Data Storage** page, in the **Map Folder on Storage Computer** field, enter the full path of the folder you want to map.

   Note: When specifying a folder on a network drive for storage, you must use the full, UNC path of the folder (for example, `\\servername\folder`). The software does not support using a virtual path that uses a drive letter (for example, `J:\folder`).

4. Click **Map Existing Folder on Storage Computer**.

The mapped folder appears in the **List of Mapped Folders**.

Note: To increase security for remote storage, you may want to set the Location Service (MD.LocationService) as a local service on each remote storage computer. Once you do this, you must set each folder mapped for storage to allow write access to the software. See Secure Setup for Remote Storage on page 72 for details.

Appendix A: Firewall and Antivirus Settings

The CellReporterXpress Installation Utility modifies Windows Firewall and Windows Defender for its services. If you are using other software for firewall and antivirus protection, configure changes for the following services and ports on all computers running a CellReporterXpress software service.

Note: Services are installed in the `%Program Files%\Molecular Devices` folder.

Item	Service Name (Executable File)	Requires Write Access	Exposed Port
Web Service	MD.WebService (MolDev.WinHost.exe)	No	TCP 80 (without a security certificate) TCP 443 (with a security certificate) TCP 12322
Data Service	MD.DataService (MolDev.DataService.exe)	Yes	TCP 12321
Core Service	MD.CoreService (MolDev.CoreService.exe)	No	TCP 12323
Location Service	MD.LocationService (MolDev.LocationService.exe)	Yes	TCP 12324
Analysis Service	MD.AnalysisService (MolDev.AnalysisService.exe)	Yes	TCP 12325
Instrument	n/a	Yes	TCP 8091 UDP 3702 TCP 9090

Note: The port used by the Web Service (TCP 80 without a security certificate and TCP 443 with a security certificate) is configurable during installation. If the default port is not available, a different port can be used.

Contact Us

Phone: +1-800-635-5577
Web: moleculardevices.com
Email: info@moldev.com

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