ImageXpress Nano High-Content Imaging System with CellReporterXpress software

Welcome to the family of Molecular Devices ImageXpress® system users. This document provides you with the necessary information to prepare your facility for the installation of your new ImageXpress® Nano High-Content Imaging System.

Environment requirements

The ImageXpress Nano system and all options are designed to operate indoors under laboratory conditions (15° to 30°C; 35% to 50% non-condensing humidity). As with any precision optical instrument, take care to maintain a low-dust, low-vibration environment. Temperature and humidity extremes can compromise performance.

Most low-magnification applications will tolerate non-optical tables that can be purchased from companies specializing in industrial furniture, such as:

- Anthro (http://www.anthro.com)
- RDM (www.rdm-ind.com)
- SteelSentry (http://www.steelsentry.com)

For high-magnification or vibration-sensitive applications, we suggest a sturdy table such as an optical breadboard from vendors such as:

- Newport (www.newport.com)
- Kinetic Systems (www.kineticsystems.com)
- TMC (www.techmfg.com)

Molecular Devices sales representatives may have recommendations for specific tables; however, it is the user's responsibility to verify weight capacity and general sturdiness of product from third party vendors. An optical table will reduce the vibration transmitted to the instrument, allowing better imaging performance in relatively poor vibration environments. We do not recommend air or hydraulic isolation tables.

Avoid installing the instrument with the following lab conditions or situations:

- Avoid installation in or next to a room where there is high-motion equipment, like elevators, air conditioners, and heaters.
- Avoid placement directly in the path of air vents, because sudden temperature changes and air-flow vibrations can degrade performance.
- Avoid placement near external vibration caused by trains or excessive vehicle traffic.
- Avoid placement in any room with noticeable vibration on floors or walls.
- Avoid placement less than 5 m (15 ft) away from refrigerators.
- Avoid placement less than 2 m (6 ft) away from doors.
- Avoid using a table that is mechanically attached to a wall.
- Avoid sharing a table with shakers, stirrers, mixers, or centrifuges.
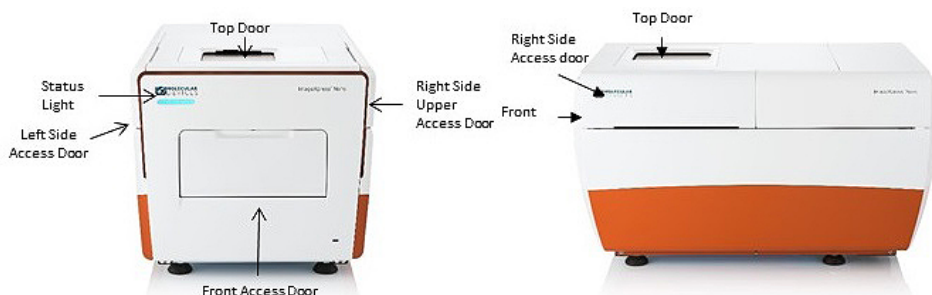

Figure 1. Instrument front and sideways installation orientation options.

Space and table requirements

A table or lab bench suitable for the size and weight of the instrument is required. The size and weight for the instrument portion of the ImageXpress Nano system are provided in Table 1. The size of the system components are provided in Table 2.

ImageXpress Nano system can be purchased with Environmental Control (EC), Transmitted Light (brightfield), and various combinations. The height and weight of the system is increased by the addition of the Transmitted Light option.

To minimize vibrations, the systems power and options controller, light source and computer should not be placed on the same table as the ImageXpress Nano instrument. Often these items are placed on the floor below the instrument. The optimal configuration is to keep components within 1.2 meters/4 feet of the instrument as cables are approximately 1.8 meters/6 feet in length. The acquisition computer for the system can be used with multiple monitors, so ample desk space for monitor placement is needed.

The instrument should be accessible on the front and the sides of the instrument to allow access to the objectives and filters.

The ImageXpress Nano instrument can be installed in one of two orientations. Sideways installation is the recommended orientation as it allows easier access to the left side doors. Space for the instrument as well as adequate clearance around the instrument is necessary for user and service access.

Figure 2. Instrument height, width, and length.

Figure 3. Distance between the outside edges of the instrument feet.

Dimensions (cm/in.)	W	L	H	Weight (kg/lbs.)
Instrument, no option, or with EC option	53/21	86/34	48/19	98/215
Instrument with TL option	53/21	86/34	81/32	103/225

Table 1. Size and weight of the ImageXpress Nano system instrument and base unit with options.

Dimensions (cm/in.)	W	L	H
Acquisition computer for ImageXpress system (optional MD)	20/8	53/21	43/17
Power and Options Controller	27/11	51/20	20/8
Light source (approximate size)	18/7	25/10	13/5

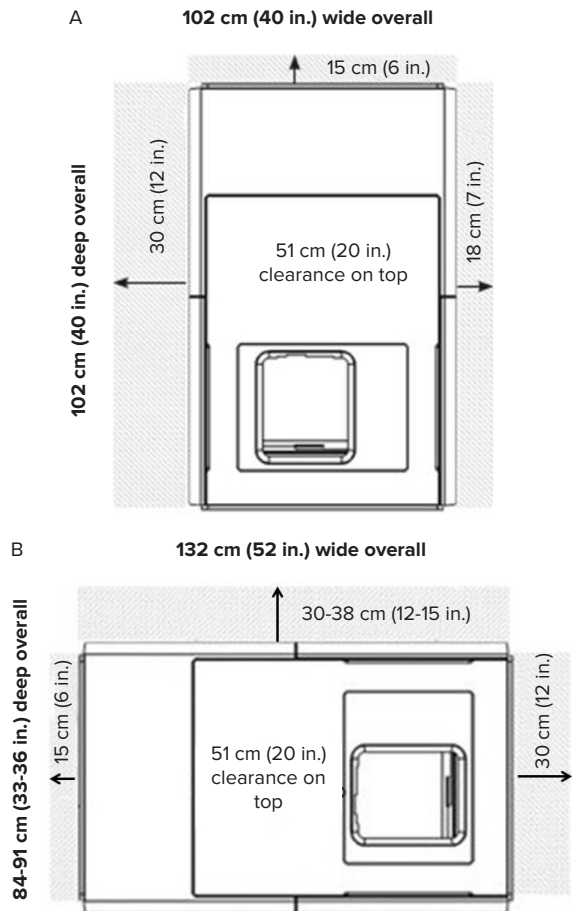**Table 2. Size and weight of the ImageXpress Nano system components.**

Figure 4. A. Front installation. B. Sideways installation. Molecular Devices recommends sideways installation to allow optimal access to the upper side door.

Power requirements

- Direct connections to all international supply voltages available.
- Use the included IEC power cord to connect the external ImageXpress Micro systems Power and Options Controller to a GROUNDED power receptacle that is rated for 15 A.
- For systems that do not include the EC option, input voltage range is from 100 VAC to 240 VAC, 50/60 Hz, 12 amps maximum.
- For systems that include EC option, input voltage range is either 100-120 VAC, 50/60Hz, 12 amps maximum or 200-240 VAC, 50/60Hz, 12 amps maximum. The appropriate version is specified at time of order.
- Fluctuations must be within ±10% of the nominal voltage.
- When using a power strip, the computer and monitor should be connected to a different power strip than the ImageXpress Nano system's Power and Options Controller that connects to the instrument and light source.

It is recommended that the Power and Options Controller be maintained on a different circuit than the computer and monitor. To limit the risk of interruption during power loss, a uninterruptible power supply (UPS) can be used to provide backup power and power line conditioning for the instrument and computer.

The power requirements for the individual components are listed in Table 3. To determine the power consumption (watts) or apparent power (volt-amperes or VA) for the ImageXpress Nano system, add together the power of all applicable components. For example the power consumption of a system without options and with 2 large monitors is 505 Watts (185+120+120+40+40). The maximum power requirement of any configuration is 805 Watts. Most of the additional power for the EC option is needed for the EC heater.

Figure 5. Instrument with EC option and monitor.

Figure 6. Instrument with Transmitted Light option and monitor.

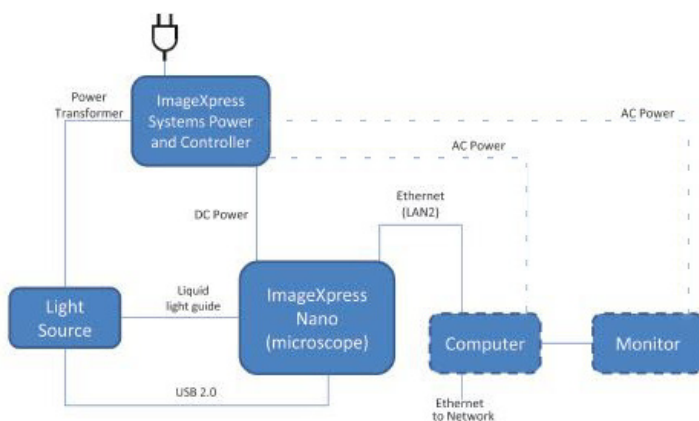Figure 7. ImageXpress Nano system components without options computer only connected to network.
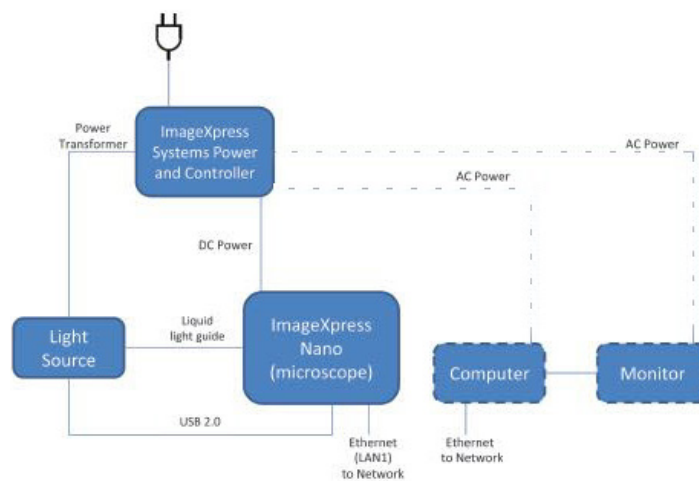
Power Requirement	Watts	VA	Power Cables
Instrument, no option	185	195	1
Instrument with TL/EC option	485	511	1
Instrument with TL option	285	300	1
Instrument with EC option	385	405	1
Light source	120	126	1, connects to power and options controller
Computer (optional MD)	120	133	1
Monitor, 27" (each) (optional MD)	40	44	1
Monitor, 22" (each) (optional MD)	20	22	1

Table 3. Power requirement for the ImageXpress Nano system.

Figure 8. ImageXpress Nano system components without options connected to network.

ImageXpress Nano with CellReporterXpress

CellReporterXpress software offers a uniquely designed user-friendly web interface and allows for the ImageXpress Nano to be networked in a variety of configurations. It takes advantage of pre-programmed analyses that are user configurable. The software allows the customer the option to purchase their own computer for installation and operation of CRX software. Alternatively the customer may purchase a computer from Molecular Devices. The minimum computer requirements for the ImageXpress Nano with CellReporterXpress are listed in the table below.

Cell ReporterXpress	Description	Notes
Operating system	Windows 10, 64Bit	
CPU speed	2.4GHZ or faster	
Logical processors	10	Logical processors are virtual processing units on the CPU that can function as additional physical processing units. 10 logical processors support 4 concurrent analysis. Add 2 logical processors for each additional analysis
RAM	12GB	12GB RAM supports 4 concurrent analyses. Add 2GB for each concurrent analysis

Table 4. Computer specifications.

CellReporterXpress supports any client device with a display of 9" or larger. See below for the list of supported web browsers for popular mobile operating systems.

Operating system	Browser support
Microsoft Windows	Google Chrome v60.0.3112 64 bit or newer
Apple Macintosh v10.12 or newer	Google Chrome and Apple Safari
Apple iOS v10.3.3 or newer	Apple Safari
Android	Google Chrome v59

Table 5. Supported operating system for clients.

Network Requirements and Firewall Exclusions

Antivirus software is highly recommended for all networked devices. To maximize the speed and performance of the ImageXpress Nano system, the firewall must not block access to the necessary ports and exclusions must be set for certain molecular devices services. See Table 6 for a list of ports and services that must be accessed through the firewall.

Configuration	Ports	Computer	Direction	Notes
All	UDP 3702	Host computer	Inbound and outbound	For auto detection of the imaging device
All	TCP 8091 TCP 9090	Host computer	Inbound	For communication with the imaging device. If the imaging device is behind a firewall, these ports should be forwarded to the imaging Device's IP address
All	TCP 8080	Host computer	Inbound	For remote client connections to the host computer
Server (with external analysis operations	TCP 12325	Host computer	Inbound	For communication between the host computer and the computer running analysis operations (MD.AnalysisService)
		Analysis computer	Outbound	
Server (with external storage operations)	TCP 12324	Storage computer	Inbound	For communication between the host computer and the computer running the storage operations (MD.LocationService)
		Host computer	Outbound	
Server (with external storage and analysis operations)	TCP 12323	Host computer	Inbound	For communication between the host computer and the computers running analysis operations (MD.AnalysisService) and storage operations (MD.LocationService)
		Analysis computer	Outbound	
		Storage computer	Outbound	

Table 6. Firewall and port configuration.

Firewall exclusions

- MD.CoreService (MolDev.CoreService.exe)
- MD.DataService (MolDev.DataService.exe)
- MD.WebService (MolDev.WebService.exe)
- MD.AnalysisService (MolDev.AnalysisService.exe)
- MD.LocationService (MolDev.LocationService.exe)

Exclusions will need to be created for all paths to storage devices. Auto updates for antivirus definitions must be enabled for increased system security. Virus scanning must be able to be turned off for troubleshooting.

Installation guidelines

During installation, the field service engineer will set up a stand-alone or network configuration to configure and test the system. This will be done using the customer-provided host computer, or the host computer optionally purchased from Molecular Devices. The host computer must be configured according to the specifications described in the CellReporterXpress IT software Configuration Guide. If no acceptable computer is available, the system will be tested and configured with the field service engineer's laptop. The customer will then be responsible for eventually connecting the host computer to the ImageXpress Nano and installing the CellReporterXpress software.

Installation supplies

Users must provide the following to assist in instrument installation:

- Sturdy table, at least 94 cm (37 in.) by 61 cm (24 in.), with 39" of vertical clearance, and rated for over 104 kg (230 lbs.) with minimal vibration
- Table clearance of 132 cm (52 in.) wide, 84-91 cm (33-36 in.) deep and with 39" of vertical clearance (sideways installation)
- Additional space or a separate table or workstation for computer keyboard, mouse and monitor(s)
- Power strip (optional)
- Online power conditioning UPS (optional, recommended)
- Network cable and 1 Gigabit network connection

Installation supplies required for Environmental Control option

- A tank or house CO_2/air mixture (e.g., 5% CO_2/95% air) as appropriate for your application
- CO_2 regulator that can supply 20 PSI (138 kilopascal)
- Tubing (¼"; 6 mm O.D.) of appropriate length to go between the ImageXpress system and CO_2 regulator
- Adapter for CO_2 regulator that can accept the ¼" (6 mm) tubing

Facility receiving requirements

Only Molecular Devices personnel are authorized to open the crates.

Equipment will arrive in 2 crates for standard system or 3 crates if an option is included. Shipping crate dimensions and weights are shown in Table 7. Crates must be stored inside and protected from environmental extremes until equipment is removed. The instrument crate requires 10 feet of clearance on one side to allow removal of the instrument from the crate.

Due to its weight, the instrument must be moved to installation site on a rolling cart (included) that is approximately 61 cm (24") wide x 92 cm (36") long.

Dimensions (cm/in.)	W	L	H	Weight (kg/lbs.)
Instrument crate	81/32	134/53	112/44	275/605
System components crate	77/30	56/22	77/30	50/110
TL or TL/EC crate, if applicable	77/30	56/22	77/30	50/110

Table 7. Shipping crate dimensions and weight.

Support and service

For support or service, please contact us at:

Web: **www.moleculardevices.com/support**
www.moldev.com/support

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