SpectraMax® MiniMax™ 300

Imaging Cytometer

Installation Guide

MOLECULAR DEVICES

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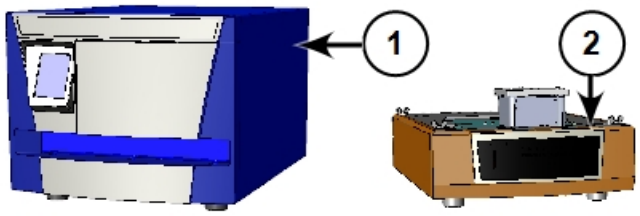
Product manufactured by Molecular Devices, LLC.
3860 N. First Street, San Jose, California, 95134, United States of America.
Molecular Devices, LLC is ISO 9001 registered.

Setting Up the SpectraMax® MiniMax™ 300 Imaging Cytometer

The SpectraMax MiniMax 300 Imaging Cytometer attaches to the bottom of the SpectraMax® i3x Multi-Mode Detection Platform. Before you unpack and set up the instruments, prepare a dry, flat work area that has sufficient space for both instruments, the host computer, and required cables.



Item	Description
1	SpectraMax i3x (microplate reader)
2	SpectraMax MiniMax 300 Imaging Cytometer (cytometer)

Note: If you install the SpectraMax i3x at the same time as the cytometer, unpack the microplate reader before you set up the cytometer, but leave the microplate reader transport locks in place until after you attach the cytometer to the microplate reader. See the *SpectraMax i3x Multi-Mode Detection Platform User Guide* or *SpectraMax i3x Multi-Mode Detection Platform Installation Guide*.

Computer Integration

Each Molecular Devices microplate reader is shipped with a license key for the SoftMax® Pro Data Acquisition and Analysis Software that you install on the computer that you use to operate the instrument. The SoftMax Pro Software provides integrated instrument control, data display, and statistical data analysis.

You should install the SoftMax Pro Software on the computer before you set up the instrument. Please be aware that some updates to the SoftMax Pro Software require a purchase. Contact Molecular Devices before you update the software. To download the latest version of the software, visit: https://www.moleculardevices.com/products/microplate-readers/acquisition-and-analysis-software/softmax-pro-software#Order.

Note: For information about the computer specifications that are required to run the software, the software installation and licensing instructions, and the directions to create the software connection between the computer and the instrument, see the *SoftMax Pro Data Acquisition and Analysis Software Installation Guide*.

The SpectraMax MiniMax 300 Imaging Cytometer is shipped with a computer that meets greater minimum computer system specifications than those required for the standard SoftMax Pro Software installation. You must install the **SoftMax Pro MiniMax Imaging Edition** of the SoftMax Pro Software on the supplied computer to operate the SpectraMax i3x with the SpectraMax MiniMax 300 Imaging Cytometer. Use of the SpectraMax MiniMax 300 Imaging Cytometer does not support the SoftMax Pro GxP Software edition.

Setting Up the System Computer

The SpectraMax MiniMax 300 Imaging Cytometer is shipped with a computer that has been tested for compatibility with the instrument. This instrument requires a computer that has very specific requirements. The computer and monitor are shipped in separate packages.

Read and follow the installation instructions included with the computer and monitor. The following information can help you with a successful computer set up.

- The graphics card on the computer has HDMI output ports. To connect the computer to the monitor, use the included DVI cable and HDMI-to-DVI adapter.
- Connect the keyboard and mouse to the USB ports on the monitor, and then connect the included USB cable between the monitor and a USB 2.0 port on the computer. Save the USB 3.0 ports in the PCI card on the rear of the computer to connect the computer to the instrument.
- Install the software before you connect the instrument to the computer, but do not start the software until after you connect the cables and apply power to the instrument. It might be necessary to install USB drivers before you start the software.
- When you install the software, you must select the **SoftMax Pro Imaging Edition** from the installation wizard to run the SpectraMax MiniMax 300 Imaging Cytometer.
- The SoftMax Pro Software requires activation. The software product key is included with the software package. Instructions for how to activate the software are included in the software installation guide and can be found in the *SoftMax Pro Data Acquisition and Analysis Software User Guide* or the application help.
- Microsoft Office is pre-installed on the computer, but requires activation. The Microsoft product license is included with the computer. To activate the Office software, click **Activate** and follow the instructions.

Required Computer Settings

If your computer hibernates or turns off during data acquisition, the transfer of data from the instrument to the software can be interrupted, which can result in data loss.

To prevent data loss, turn off all sleep and hibernation settings for the hard disk, the CPU, and the USB ports. Disable automatic Windows updates. Update Windows manually when you do not use the computer to control an instrument.

To define computer settings in the Windows Control Panel.

1. Open **Control Panel**.
2. Click **Hardware and Sound**.

3. Under **Power Options**, click **Change When the Computer Sleeps**.
4. Click **Change advanced power settings**.
5. On the Power Options dialog, set **Hard disk > Turn Off Hard Disk After** to **Never**.
6. Set **Sleep > Sleep After** to **Never**.
7. Set **Sleep > Hibernate After** to **Never**.
8. Set **USB Settings > USB Selective Suspend Setting** to **Disabled**.
9. Click **OK**.
10. Return to the Control Panel Home page.
11. Click **System and Security**.
12. Under **Windows Update**, click **Turn Automatic Updating On or Off**.
13. Under **Important Updates**, clear the **Install Updates Automatically** check box. Select one of the other options.
14. Click **OK**.
15. Close **Control Panel**.

Cytometer Package Contents

The package contains the imaging cytometer and the accessories required to install the instrument.

Illustration	Part Number	Description
SoftMax Pro Software	Latest version	SoftMax Pro Software installation guide with Product Key
	5024111	Installation guide
	Not applicable	Foam pad from the shipping container
	5024094	2.5 mm hex key
	5025413	3.0 mm hex key
	5024986	2 Laser-interlock brackets with 4 machine screws
	17-100-0010	Flat head screwdriver
	5018965	USB interconnection cable, 0.9 meter (3 foot)
	5025874	2 USB cables, 2 meter (6.6 foot)
	5022671	SpectraMax i3 Platform Transmitted Light (TL) Detection Cartridge

For a complete list of the contents of the package, see the enclosed packing list.

The SpectraMax MiniMax 300 Imaging Cytometer is operated by a computer that has rigid specifications. Molecular Devices provides this computer and a monitor. The computer and monitor are shipped in separate packages.

The SoftMax Pro Software installation places a copy of the available microplate reader user guides (.pdf) in the following location on the computer:

C:\ProgramData\Molecular Devices\User Guides

The most recent version of the microplate reader user guides and the *SoftMax Pro Data Acquisition and Analysis Software User Guide* are available on the Molecular Devices Knowledge Base:

In the software, select the **Home** tab, click **Contact Us**, and then select **Knowledge Base**.

Or go to www.moleculardevices.com/service-support.

Unpacking the Cytometer

The package is designed to protect the instrument during transportation.

WARNING! LIFTING HAZARD. To prevent injury, use a minimum of two people to lift the instrument.

Note: Retain the shipping box and all packaging materials for future transport needs. Do not use tools that can damage the packaging or the instrument.

CAUTION! When transporting the instrument, warranty claims are void if improper packing results in damage to the instrument.

To unpack the cytometer:

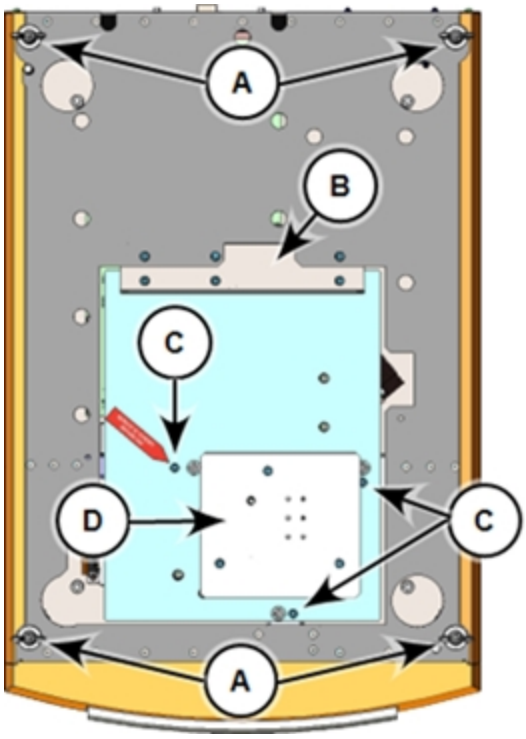
1. Inspect the box for damage that occurred during transportation. Inform the supplier immediately and keep the damaged packaging.
2. With the box facing up as indicated on the packaging, cut open the top of the box.
3. Remove the top layer of packaging foam. You will use this piece of foam during the installation process.
4. Remove the next layer of packaging foam that holds the tools and accessories.

   CAUTION! Keep the instrument upright. Do not tip or shake the instrument to prevent damage to the moving components inside the instrument.

5. With one person on each end, lift the instrument out of the box and place the instrument on a flat area.
6. Remove the plastic bags from the instrument.

Removing Shipping Protections

To prevent damage during shipping, four wing nuts secure the bolts in the corners, a transport bracket with six blue retaining screws and three more blue retaining screws secure the optics plate on the top of the cytometer, and a cover with three blue retaining screws protects the optical components in the optics tower.



Optics Protection for Shipment	Description
A	4 Wing nuts and bolts
B	6 Transport bracket and retaining screws
C	3 Optics plate retaining screws
D	3 Optics cover and retaining screws

CAUTION! Never touch the optic mirrors, lenses, filters, or cables. The optics are extremely delicate, and critical to the function of the instrument.

Required Tool	Part Number	Description
	5025413	3.0 mm hex key

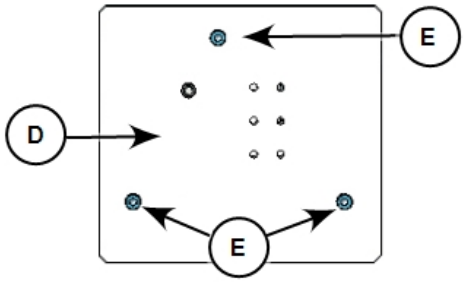
To remove the shipping protections from the cytometer:

1. Use your hand to remove the four wing nuts (A) from the bolts attached to the corners of the instrument. Do not remove the bolts.

2. Use the 3.0 mm hex key to remove the six blue retaining screws that secure the transport bracket (B) to the instrument.
3. Remove the transport bracket and store the retaining screws in the bag that held the 3.0 mm hex key.
4. Press down firmly on the optics plate and use the 3.0 mm hex key to remove the three blue retaining screws (C).

> **CAUTION!** Maintain firm downward pressure on the optics plate until you remove all the screws are removed. When you remove the last screw, the optics plate might "pop" into position.

5. Gently remove pressure from the optics plate to let the springs below the plate extend.
6. Store the optics plate retaining screws in the bag that held the 3.0 mm hex key.
7. Use the 3.0 mm hex key to remove the three blue retaining screws (E) that secure the optics cover (D) to the optics tower.



Optics Cover (top view)	Description
D	Optics cover
E	3 Optics cover retaining screws

8. Store the 3.0 mm hex key and the retaining screws in the bag that held the 3.0 mm hex key.
9. Lift the cover straight up to remove it from the cytometer.
10. Store the transport bracket, the optics cover, and the bag with the 3.0 mm hex key and retaining screws in the cytometer shipping container.

Attaching the Cytometer to the Microplate Reader

Prepare a work area that is approximately 130 cm (51.2 in.) wide and 65 cm (25.6 in.) deep, preferably with access on all sides to lift the instruments.

The required vertical clearance for this procedure is 56 cm (22.0 in.).

WARNING! LIFTING HAZARD. To prevent injury, use a minimum of two people to lift the instrument.

Required Accessory	Part Number	Description
	Not applicable	Foam pad from the shipping container
	5024094	2.5 mm hex key
	5024986	2 Laser interlock brackets with 4 screws
	17-100-0010	Screwdriver

Note: Retain all packaging materials, including the optics access cover and foam block for future transport needs. Do not use tools that can damage the packaging or the instrument.

CAUTION! When transporting the instrument, warranty claims are void if improper packing results in damage to the instrument.

To attach the cytometer to the microplate reader:

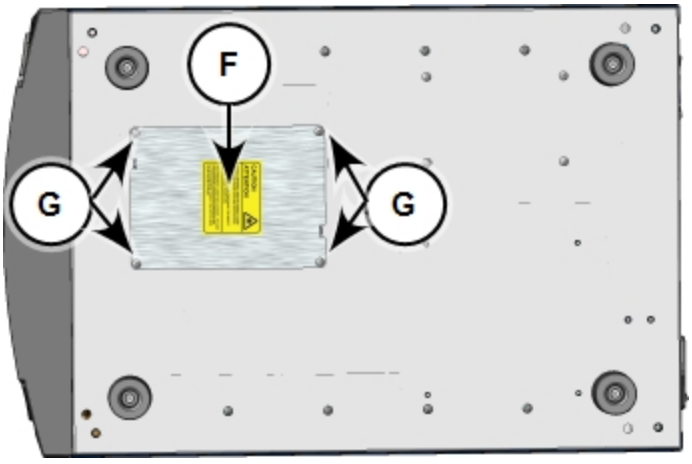
1. Place the foam pad from the shipping container on one side of the microplate reader.

   CAUTION! If you used the SpectraMax i3x, remove all plates and detection cartridges from the instrument and install the transport locks on the plate drawer and detection cartridge drawer. See the user guide for the SpectraMax i3x.

2. Use two people to carefully place the microplate reader on its side on top of the foam pad.

   WARNING! PINCH HAZARD. There is limited clearance between the side of the microplate reader and the work bench.

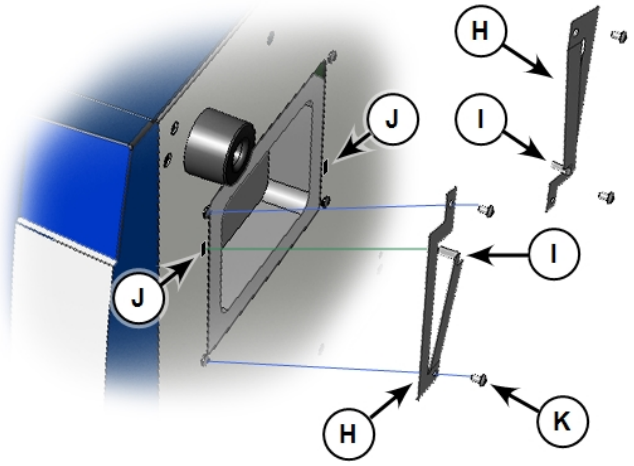
3. Use the 2.5 mm hex key to remove the four screws (G) that secure the optics access cover (F) to the bottom of the microplate reader.



Optics Access Cover (Bottom of Microplate Reader)	Description
F	Optics access cover
G	4 Screws

4. Remove the optics access cover (F) from the microplate reader and store the optics access cover and screws in the cytometer shipping container.
5. Grasp the foam block in the optics access opening and then gently pull the foam block out. Store the foam block in the cytometer shipping container.

6. Place one of the laser interlock brackets (H) over the optics access opening with the interlock tab (I) on the bracket inserted into the corresponding alignment slot (J) on the bottom of the microplate reader.



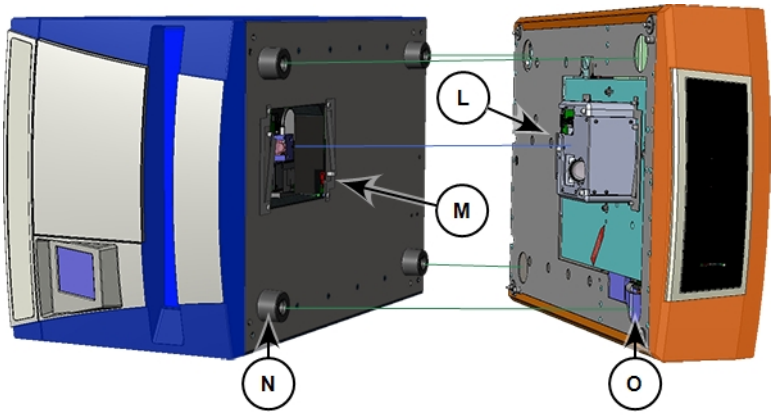
Laser Interlock Brackets	Description
H	2 Laser interlock brackets
I	2 Interlock tabs
J	2 Alignment slots
K	4 Screws

7. Use the 2.5 mm hex key and two of the bracket screws (K) to secure the laser interlock bracket (H) to the bottom of the microplate reader.
8. Attach the other laser interlock bracket (H) with the interlock tab (I) inserted into the corresponding alignment slot (J), and then use the other two screws (K) to secure the bracket to the bottom of the microplate reader.
9. Lightly press on the interlock tabs (I) to make sure that they freely slide in and out of the alignment slots (J).

Note: The laser interlock brackets are part of the hardware interlock that prevents the laser module from turning on unless the cytometer is installed. For the interlocks to work properly, the interlock tabs must freely slide in and out of the alignment slots.

10. Carefully place the cytometer on its side on the foam pad so that the top of the cytometer faces the bottom of the microplate reader.

Note: you might need to slide the microplate reader on the foam pad to make room for the cytometer.



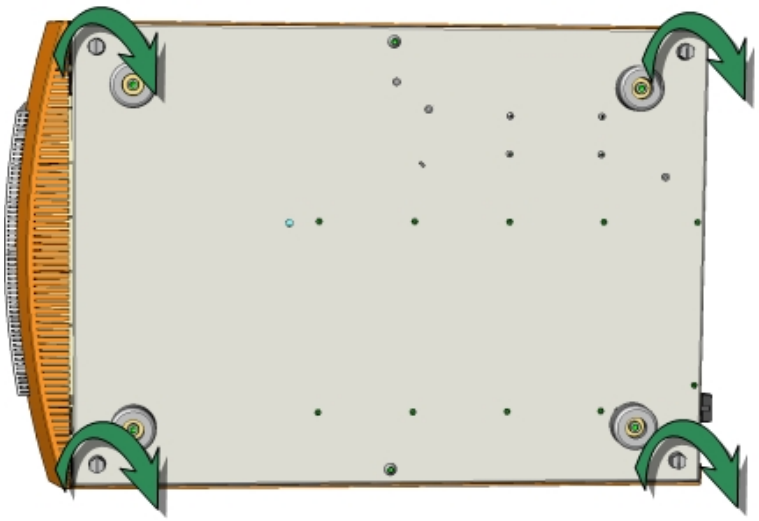
Item	Description
L	Optics tower
M	Optics access opening
N	4 Microplate reader feet
O	4 Microplate reader foot openings

WARNING! PINCH HAZARD. There is limited clearance between the bottom of the microplate reader and the top of the cytometer. The top of the cytometer is beveled to help provide clearance for fingers.

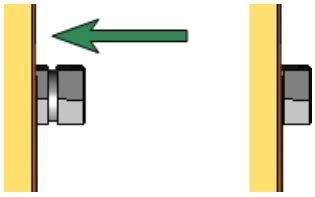
11. Slide the cytometer into the microplate reader. Make sure that the optics tower (L) fits into the optics access opening (M) and the four feet (N) on the microplate reader fit into the four foot openings (O) on the cytometer.

12. Use a flat head screwdriver to tighten one of the four bolts on the bottom of the cytometer.

> **Note:** You might need to use your free hand to push the cytometer into the reader to start the bolt and engage the threads.



13. Attach the other three bolts to secure the cytometer to the microplate reader.
    Make sure that the bolts are properly seated on the bottom of the cytometer.



Properly Seated Bolt

14. Use two people to stand the combined microplate reader and cytometer in an upright position.
15. Store the packing materials, tools, optics-access cover, screws, and foam block in the cytometer shipping container.

Removing Transport Locks

CAUTION! The instrument can be damaged if the you do not remove the transport locks before you power on the instrument.

There are transport locks on the detection cartridge drawer and the plate drawer to protect the instrument from damage during shipping. You must remove the transport locks before you power on the instrument.

Note: If you install the SpectraMax MiniMax 300 Imaging Cytometer, leave the transport locks in place until after you attach the cytometer to the microplate reader. See the installation guide or user guide.

Required Tool

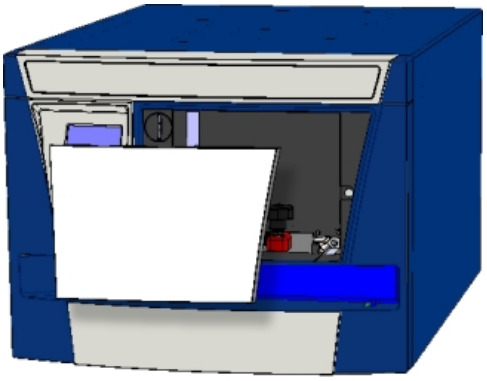
Illustration	Part Number	Description
	YW 000 006	2.0 mm hex key

CAUTION! Do not touch or loosen screws or parts other than those specifically designated in the instructions. Doing so could cause misalignment and possibly void the warranty.

CAUTION! The front cover is held onto the front of the instrument by powerful magnets. Keep magnetic storage devices or strips, such as hard drives, key cards, and credit cards, away from the instrument covers.

To remove the transport locks:

1. Firmly pull on the front cover from the bottom to remove it. The front cover is held in place by magnets.



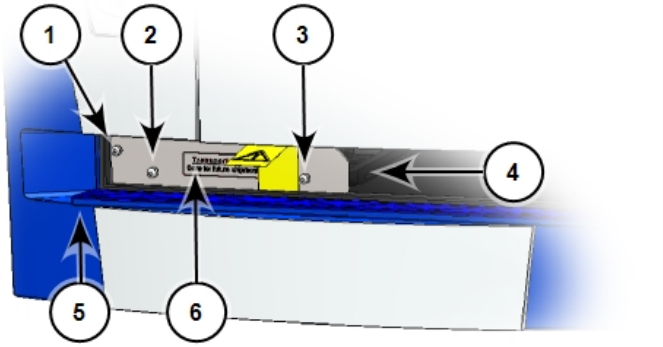
2. Turn the knob on the detection cartridge drawer transport lock counter-clockwise until it is free of the hole in the floor of the drawer compartment.

Item	Description
1	Detection cartridge drawer
2	Detection cartridge drawer transport lock

3. Slide the detection cartridge drawer forward until it is outside of the instrument.
4. Lower the detection cartridge drawer transport lock to remove it from the detection cartridge drawer. Store the transport lock in the accessories tool box.
5. Push the detection cartridge drawer back inside the instrument.
6. Align the magnets on the inside of the front cover with the magnets on the instrument base to replace the front cover.

7. Gently pull the yellow tab that protrudes from the plate chamber door to open the door. Hold the door (5) open while you remove the transport lock.

Note: Do not to tear the yellow tab. It remains attached to the transport lock to make it easier to open the plate chamber door.



Item	Description
1	Screw #1 fastens the lock to the internal frame of the instrument
2	Screw #2 fastens the lock to the plate drawer
3	Screw #3 fastens the lock to the plate drawer
4	Plate drawer
5	Plate chamber door in open position
6	Plate drawer transport lock

8. Use the 2.0 mm hex key to loosen screw #1 in the upper-left corner of the transport lock until the lock disconnects from the instrument frame. The screw has a retaining washer to prevent removal from the lock.

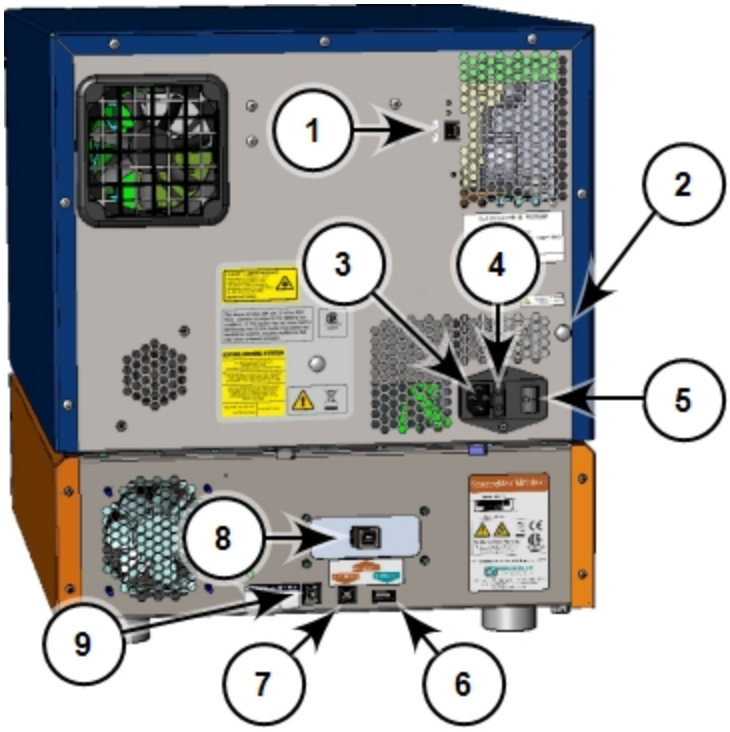
Tip: After you loosen screw #1, pull the plate drawer slightly out of the instrument to hold the chamber door open.

9. Loosen screws #2 and #3 until the lock comes free of the plate drawer and you can remove the lock from the instrument. The screws have retaining washers that prevent removal from the lock. Store the transport lock in the accessories tool box.
10. Push the plate drawer back inside the instrument and close the chamber door.
11. Save the carton, foam inserts, accessories tool box, and transport locks for future shipments.

Connecting Instrument Cables

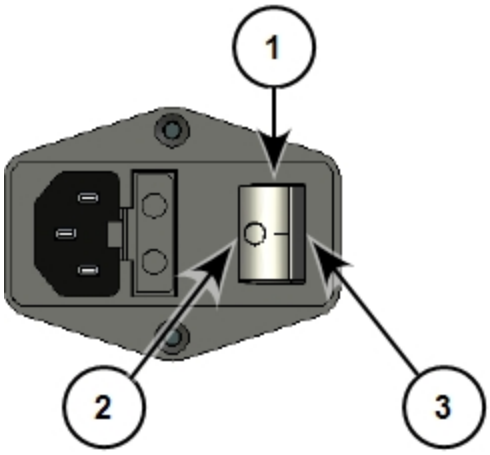
The power cord and USB cables connect the ports on the rear of the instruments to the computer and the power supply. Two USB cables connect from the cytometer to the computer. One controls the instrument and one controls the camera. A third USB cable connects the microplate reader to the cytometer.

Required Accessories	Part Number	Description
	5018965	USB interconnection cable, 0.9 meter (3 foot), provided with the cytometer
	5025874	2 USB computer connection cables, 2 meter (6.6 foot)
	VN 18S S01 or VN 18F F01 01	AC power cord, provided with the microplate reader



Item	Description
1	Microplate reader USB port
2	Gas inlet quick-connect fitting
3	Power port
4	Fuse carrier
5	Power switch

Item	Description
6	Interconnect USB port
7	Cytometer USB port 1
8	Cytometer USB port 2
9	Alternative power input for the SpectraMax i3 Multi-Mode Microplate Reader.

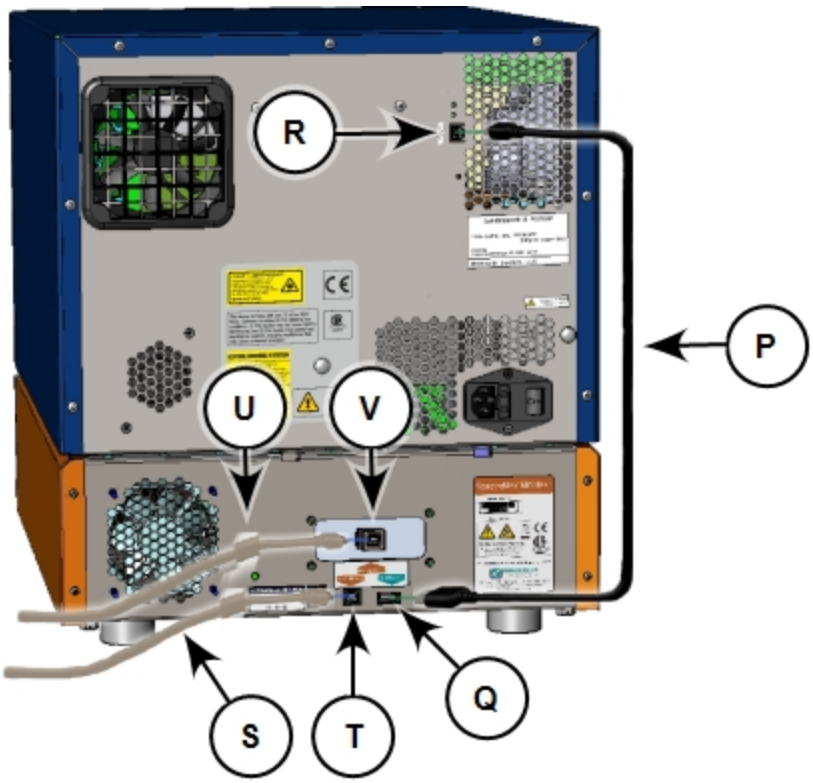


Item	Description
1	Power switch
2	Off
3	On

To connect the cytometer cables:

1. Place the instrument and the computer on a work area with sufficient space for the two devices and the required cables. To ensure sufficient ventilation and provide access to disconnect power from the instrument, maintain a 20 cm to 30 cm (7.9 in. to 11.8 in.) gap between the rear of the instrument and the wall.
2. Make sure that the power switch on the rear of the microplate reader is in the Off position.

3. Connect one end of the shorter USB cable (P) supplied with the cytometer to the interconnect USB port labeled **SpectraMax® System** (Q) on the rear of the cytometer, and then connect the other end of the USB cable to the microplate reader USB port (R) on the rear of the microplate reader.



USB Connections	Description
P	USB interconnection cable, 0.9 meter (3 foot), provided with the cytometer
Q	Interconnect USB port
R	Microplate reader USB port
S	USB computer connection cable, 2 meter (6.6 foot), provided with the cytometer
T	Cytometer USB port 1
U	USB computer connection cable, 2 meter (6.6 foot), provided with the cytometer
V	Cytometer USB port 2

4. Connect one end of the 2 meter USB cable (S) supplied with the cytometer to the USB 3.0 port in the PCI card on the rear of the computer, and then connect the other end of the USB cable to the USB port labeled **COMPUTER USB 1** (T) on the rear of the cytometer.

   Note: You must use the 2 meter USB cables supplied with the cytometer to connect the instrument to the computer.

5. Connect one end of the 2 meter USB cable (U) supplied with the cytometer to the USB 3.0 port in the PCI card on the rear of the computer, and then connect the other end of the USB cable to the USB port labeled **COMPUTER USB 2** (V) on the rear of the cytometer.

   Note: The USB port labeled **COMPUTER USB 2** is the connection for the camera. It must be connected to a USB 3.0 port on the rear of the computer that is labeled for use with the SpectraMax MiniMax 300 Imaging Cytometer.

6. For the SpectraMax i3, connect the power supply to the cytometer port on the rear of the cytometer labeled **Alternative Power Input** and connect the other end to a wall outlet. The alternative power supply is not required for the SpectraMax i3x.
7. Set the power switch on the rear of the instrument to the On position and wait for the instrument to complete its initialization routine.

   You might be prompted to install USB drivers, which must be done before you start the software.

   CAUTION! The instrument can be damaged if the transport locks are not removed before you power on the instrument. See Removing Transport Locks on page 15.

Calibrating the Cytometer

When you first install the SpectraMax MiniMax 300 Imaging Cytometer, the well image needs to be calibrated. This procedure can be done only by trained personnel.

Transmitted Light (TL) Detection Cartridge

The Transmitted Light (TL) Detection Cartridge provides white LED illumination to do brightfield, transmitted-light imaging when you use the SpectraMax MiniMax 300 Imaging Cytometer. The StainFree™ Cell Detection Algorithm eliminates cell staining for cell counting and confluency measurements using proprietary transmitted light analysis technology.

The Transmitted Light (TL) Detection Cartridge occupies one slot in the detection cartridge drawer.

Installing Detection Cartridges

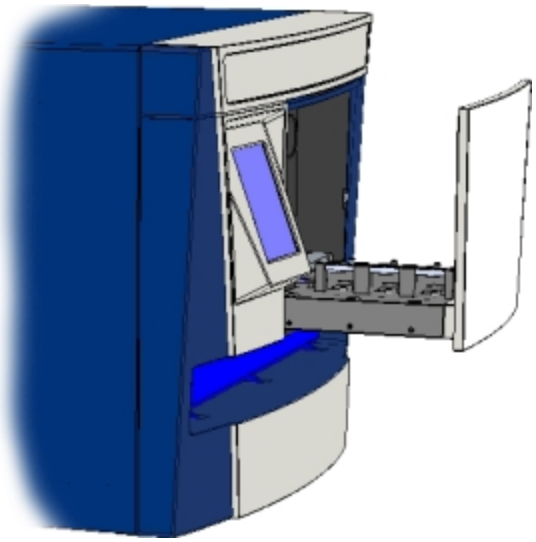
When you install a detection cartridge in the instrument, the SoftMax Pro Software detects the cartridge and displays the related data acquisition settings on the Settings dialog and enables the applicable read modes. You can install most detection cartridges into any of the first three slots in the detection cartridge drawer. The slot furthest to the rear (slot 4) is reserved for the SpectraMax Injector Cartridge.

Note: When you use the software in offline mode, all detection cartridges display on the Settings dialog.

CAUTION! To prevent damage to the installed detection cartridges and the instrument, do not manually slide the detection cartridge drawer in or out when the instrument is powered on or when one or more detection cartridges are installed in the drawer.

To install a detection cartridge:

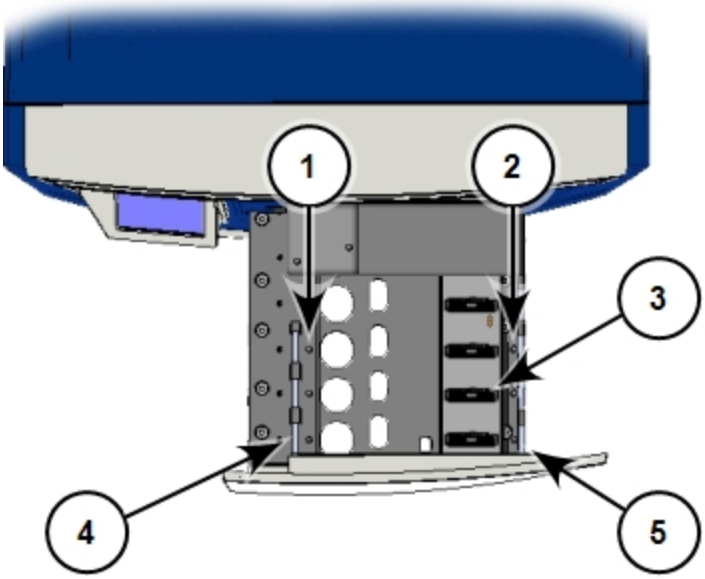
1. On the microplate reader touchscreen, touch  to open the detection cartridge drawer.



2. Remove the red cap from the detection cartridge. The Transmitted Light (TL) Detection Cartridge does not require a red cap.

3. Position the two small holes and the connector pins on the detection cartridge over the holder pins and connector for the detection cartridge slot.

Note: Some detection cartridges occupy more than one slot.

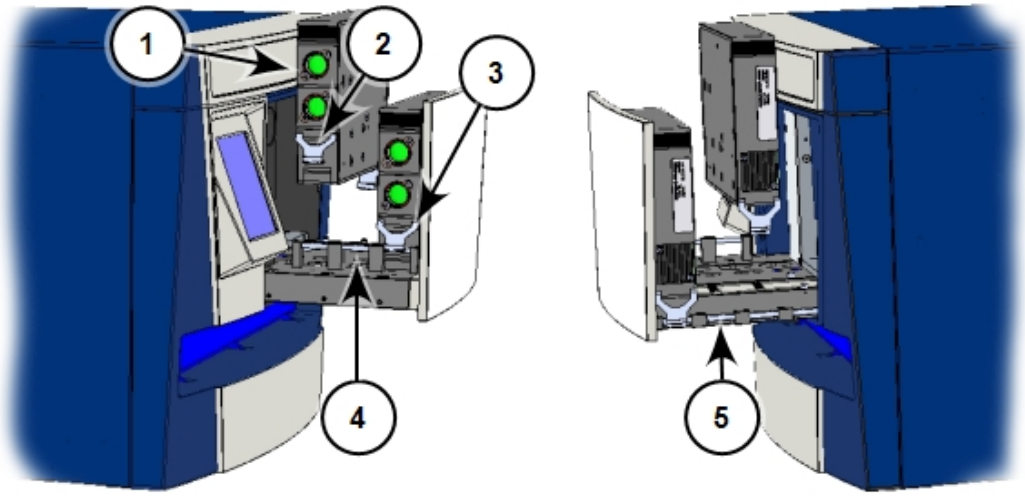


Item	Detection Cartridge Drawer Top View
1	Holder pin
2	Holder pin
3	Detection cartridge connector
4	Retaining rod
5	Retaining rod

4. Gently but firmly push the detection cartridge onto the holder pins and connector so that the detection cartridge is fully seated in the detection cartridge slot.

5. Push the two retaining clips on either side of the detection cartridge so that they fasten securely to the retaining rods on both sides of the detection cartridge drawer.

Note: Detection cartridges that occupy more than one slot have two retaining clips on each side. Securely fasten all retaining clips to the retaining rods on both sides of the detection cartridge drawer.



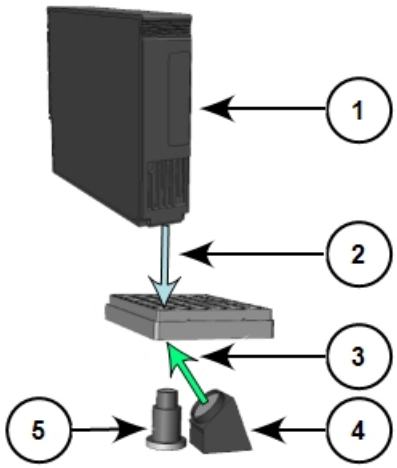
Item	Detection Cartridge Retaining Clips and Retaining Rods
1	Detection cartridge
2	Retaining clip unattached
3	Retaining clip attached
4	Retaining rod
5	Retaining rod

6. Touch  to close the detection cartridge drawer.
7. Start the SoftMax Pro Software and connect to the instrument.

   If the software is running and connected to the instrument, select the Operations tab and click **Refresh** to let the software detect the detection cartridges.

Selecting the Light Source for Imaging

The SpectraMax MiniMax 300 Imaging Cytometer captures images from the bottom of each plate well. You can illuminate the sample with white transmitted light from the top of the plate when you use the Transmitted Light (TL) Detection Cartridge, or you can use fluorescent excitation from the bottom of the plate. See Transmitted Light (TL) Detection Cartridge on page 21.



Path of Selected Light Sources

Item	Description
1	Transmitted Light (TL) Detection Cartridge
2	Path of white light from the Transmitted Light (TL) Detection Cartridge
3	Path of fluorescent excitation
4	Light source for fluorescent excitation
5	Camera lens

For best results with transmitted-light reads, use a plate with no cover. You can use a clear cover, if required. For Fluorescent reads, you can use a plate with a solid cover.

Contact Us

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