QUANSYS BIOSCIENCES

Q-View™ IMAGER PLUS

Operator's Manual

Version 1.2
For Research Use Only
Not For Use in Diagnostic Procedures

Introduction

The Q-View™ Imager Plus is designed to acquire high quality images of chemiluminescent 96-well microtiter plates. It is intended for research use only. Q-View Software™ is intended to be used to control the instrument and for the analysis of data produced by the Q-View Imager Plus.

Notes on Safety

The Q-View Imager Plus has been designed and certified to meet EN61010-1 requirements, which are internationally accepted electrical safety standards. Certified products are safe to use when operated in accordance with the device instruction manual. It is critical that the user read this manual in its entirety and train on the device frequently to ensure proper operation. For laboratory use only, Pollution Degree 2 or better. Recommended for use below 2000 m. If the device is used outside of the instructions herein or modified, disassembled, or altered, the safety of the device cannot be guaranteed. Improper operation will:

1. Void the manufacturer's warranty
2. Void the regulatory certification
3. Create a potential safety hazard

Manual Markings

Indicates a warning: Warnings help prevent safety issues or failures in performance.

Indicates an important notification: Important notifications alert the user to certain steps that are critical for optimal performance.

Notice of Warranty

THIS LIMITED WARRANTY COVERS NORMAL USE. QUANSYS BIOSCIENCES DOES NOT WARRANT AND IS NOT RESPONSIBLE FOR DAMAGES CAUSED BY MISUSE, ABUSE, ACCIDENTS, VIRUSES, UNAUTHORIZED SERVICE OR PARTS, OR THE COMBINATION OF QUANSYS BIOSCIENCES BRANDED PRODUCTS WITH OTHER PRODUCTS. THIS LIMITED WARRANTY DOES NOT COVER NON-QUANSYS BIOSCIENCES BRANDED PRODUCTS. ANY WARRANTY APPLICABLE TO NON-QUANSYS BIOSCIENCES BRANDED SOFTWARE OR PRODUCTS IS PROVIDED BY THE ORIGINAL MANUFACTURER.

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QUANSYS BIOSCIENCES

Chapter 1: Installation and Safety Information

SAFETY PRECAUTIONS

Plate Ejector

Do not attempt to remove any plates from or insert any plates into the plate tray while the plate ejector is moving. The status LED will turn yellow as the plate ejector opens and strobe until the plate ejector is closed. Only remove or insert plates when the plate ejector is fully extended and is no longer in motion. Any body parts, clothing, or other objects placed in the path of plate ejector travel may be damaged or injured. Upon obstruction of the plate ejector, the indicator light will no longer strobe but remain a solid yellow. Press the plate ejector button to open or close the plate ejector. Do not attempt to close the plate ejector by pushing on it.

Electricity

Since the Q-View Imager Plus has a 110V/220V power supply, exercise typical precautions to ensure shocks do not occur. Do not place liquids close to the Q-View Imager Plus and do not cut cords that provide power or connect the device to the PC.

PLACEMENT IN THE LABORATORY

Temperature and Humidity

The Q-View Imager Plus has 4 high-resolution cameras. If the ambient lab temperature is too high, the cameras may be unable to perform correctly. Recommended operating conditions are 18–27° C. Humidity can also cause operation problems for the Q-View Imager Plus. Ensure your laboratory environment does not exceed a dew point of 17° C to prevent condensation.

NOTE: Q-View Software prevents imaging when the target temperature cannot be reached.

Ventilation and Dust

The fan on the bottom of the device pulls ambient air into the device to cool it. Ensure the room where the Q-View Imager Plus is placed has adequate ventilation to ensure proper cooling. It is important to keep any objects, such as paper or other flat materials, away from the bottom of the Q-View Imager Plus as these can block airflow to the fan. Dust, in high levels, can be pulled into the fan and adhere to the camera cooling apparatus. Dust can also collect on the glass on the plate tray and cause dust particles to be visible in your image. Please take precautions to keep the lab bench surface and floors clean of dust.

Space

The footprint of the Q-View Imager Plus is 24.45 W x 31.75 D x 35.88 H cm (9 5/8 x 12 1/2 x 14 1/8 inches). Ensure the space around the Q-View Imager Plus is free of chemicals that can spill or other equipment that can fall and damage the Q-View Imager Plus.

Vibration

The exposure times of the Q-View Imager Plus can be up to 5 minutes. It's important that the location of the Q-View Imager Plus is free of excessive vibration. Make sure equipment that might cause vibrations such as vortex mixers, shakers, centrifuges, etc. are not located on the bench with the Q-View Imager Plus. Also consider where the Q-View Imager Plus is placed in the laboratory. For example, the Q-View Imager Plus should not be placed on a bench near a door that could be slammed or on a bench near a desk where someone could bump it during image capture.

Q-VIEW IMAGER PLUS SETUP

Assembly

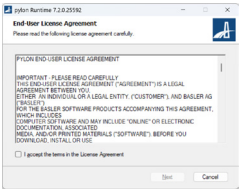
The Q-View Imager Plus weighs approximately 13.6 kg (30 lbs). To correctly set up the Q-View Imager Plus, the following steps should be followed:

1. Place the Q-View Imager Plus in a clean work area. Ensure the location meets the requirements addressed in "Placement in the Laboratory" section above.
2. Connect the power supply to the Q-View Imager Plus.
3. Plug in the wall cord.
4. Install the Q-View Imager Plus Drivers on the computer that will be connected to the imager if you are not using a computer provided by Quansys Biosciences.

a. Plug in the portable USB drive into the USB port.

b. With administrator privileges, launch the driver installer named "pylon_ Runtime_7.2.0.25592.exe".

c. Proceed through the installer.



5. Connect the USB cord to a USB 3 port on the computer that will be running Q-View™ Software. Using a rear port on the computer is recommended.

6. Turn on the Q-View Imager Plus.

7. Press the plate ejector button to open the plate ejector of the Q-View Imager Plus, ensure the area where the plate tray fits is free from debris and liquids.

8. Clean the plate tray with a lint-free cloth and 70% ethanol in deionized water, rubbing alcohol, or window cleaner.

9. Place the plate tray in the plate ejector aligning the notch at the top of the plate tray. The embossed "A" should be in the upper left corner when inserted correctly.

10. Open Q-View Software. The connected imager should automatically be detected and a dialog box should open with a link to Manage Imagers. If this does not occur, in the Settings menu, click Manage Imagers.

11. From the Manage Imagers menu the connected imager may be named and a dark field acquired. If using a computer purchased from Quansys Biosciences, setup is complete at this point.

Acquire Dark Field

Dark Field Image Acquisition minimizes background noise in subsequent plate images. If the Q-View Imager Plus is connected to a computer provided by Quansys Biosciences, Dark Field Acquisition should already be complete and does not need to be repeated. If a Dark Field Image has not been captured, remove any plates from the Q-View Imager Plus, and close the Q-View Imager Plus tray. In the **Settings** menu click on **Manage Imagers**. Select the correct imager and press **Capture Dark Field**. The process will take approximately 35 minutes.

At the conclusion of darkfield capture, Q-View Software will provide the option to use the Imaging Sensor Alignment Plate (see accessory plates below). For best image quality, it is recommended to use the alignment plate after each darkfield. Follow the software prompts to complete this process.

Setup Completion

Once the Q-View Imager Plus setup is finished, the software opens with the **Update Preferences** dialog box. Select your preferences and log in if user accounts are enabled. If your Internet connection on any computer running Q-View Software goes through a proxy, specify these settings under **Administration > Network Settings**. Your Q-View Software and Q-View Imager Plus are now ready to use.

ACCESSORY PLATES

Every Q-View Imager Plus comes with several accessory plates. These plates consist of the Qualification Plate, Focus Plate, and Imaging Sensor Alignment Plate. Each plate is labeled with a barcode that can be read by the Q-View Imager Plus.

The Qualification Plate is used for qualifying the imager during performance qualification (PQ). This plate filters out light from the internal LEDs to ensure that the camera array is appropriately measuring signal across the detectable range. Users are prompted to use this plate during PQ.

The Focus Plate is used to verify the focus plane of the imager. In the unlikely event that the focus plane has shifted, contact Quansys Biosciences technical support for assistance.

The Imaging Sensor Alignment Plate is used to combine images from the 4-camera Q-View Imager Plus system into one image used for data analysis. It is used during the initial configuration and each time a new darkfield is captured.

In some cases, it may be necessary to manually input the serial number of the plate into the Q-View Software. For your convenience, please find the barcode numbers, located on each of the accessory plates, and write them in the Appendix of this manual.

MOVING THE Q-VIEW IMAGER PLUS

Ensure there is no plate on the plate tray in the Q-View Imager Plus and unplug all cords. The Q-View Imager Plus weighs approximately 13.6 kg (30 lbs).

To move or ship the Q-View Imager Plus, there are several critical steps that should take place.

1. Ensure the new location meets the requirements addressed in "Placement in the Laboratory"
2. Remove any remaining plates on the plate tray
3. Remove the plate tray insert
4. Remove all cords from the device
5. Insert the Q-View Imager Plus into the provided plastic sleeve
6. Insert the plate tray into the protective sleeve
7. Bundle and tie cables together
8. Insert the Q-View Imager Plus into the foam insert in the Q-View Imager Plus box
9. Place the plate tray, and cords into the box

CHEMICAL SAFETY

The only chemicals used with the Q-View Imager Plus are deposited within the wells of the plate, which is placed on the plate tray. It is important to take precaution that these chemicals do not spill onto the plate tray. If any spillage occurs on the plate tray, clean it immediately before closing the plate ejector. If liquids are present on the plate tray, they may drip onto the camera lenses and damage the Q-View Imager Plus.

ELECTRONIC CONSIDERATIONS

Power Cord

The power cord is a 3-wire grounding-type plug. This cord will only fit into a grounded outlet, which is a requirement for the Q-View Imager Plus. Do not remove the grounding leg of the plug. Doing so will void all warranties on the Q-View Imager Plus.

The power cord provided with the Q-View Imager Plus is specific to the power supplied in your region. If you have a different voltage supply or need a different power cord for any reason, please contact technical support. Do not use an extension cord for the Q-View Imager Plus. Ensure that all equipment plugged into the same circuit as the Q-View Imager Plus does not exceed the amperes of service, or you may experience a tripped breaker or power failure that could result in the loss of your image.

Before unplugging the power cord, make sure Q-View Software is closed on the PC. Make sure the USB cord is unplugged. At this point, it is safe to remove the power cord.

USB Cord

The USB cord connects the Q-View Imager Plus to the PC, which controls and operates the Q-View Imager Plus. This cord should only be unplugged from the Q-View Imager Plus once Q-View Software is closed.

ROUTINE MAINTENANCE

Cleaning

Cleaning the glass is recommended before every use. Ensure that the plate tray is free from dust and any chemicals. To clean the glass, use 70 percent ethanol or warm water. Do not use scouring cleaners or abrasive pads as this can scratch the glass. Be careful not to spill any cleaning materials inside the Q-View Imager Plus.

The exterior of the device can be cleaned as needed with 70% Ethanol, Rubbing Alcohol, A neutral detergent, or 10% Bleach. Again, be careful not to spill any cleaning materials inside the Q-View Imager Plus.

Regularly Inspect the dust filter located on the bottom of the imager and clean as needed. The dust filter is attached magnetically to the body of the imager. To clean, remove the filter and wipe, wash or blow away accumulated dust. Ensure the filter is clean and dry before reattaching it to the imager.

Regularly inspect all cables for fraying or loose connections.

Chapter 2: System Overview

EXTERNAL FEATURES

Plate Ejector Button

There is 1 button on the front of the Q-View Imager Plus. Pressing this button will open and close the plate ejector allowing the user to place or remove a plate from the plate tray.

LED Status Indicator

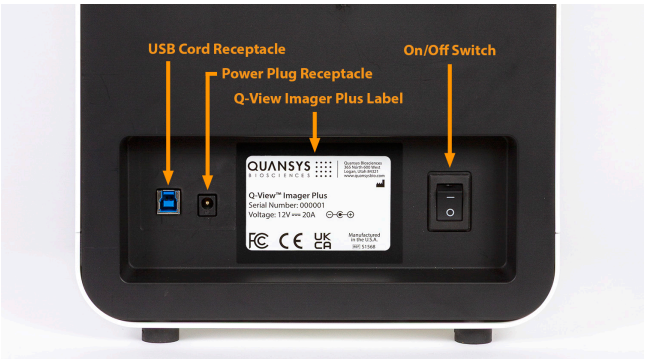
The LED light on the front of the Q-View Imager Plus will change color to indicate the status of the device. The indicator color scheme has been designed to be user friendly for those with normal vision and more common forms of color blindness. The table below is the legend for status light indication.

LED Color		Activity*	Imager Status
White		Solid	Startup
White		Pulse	Sleep
White		Strobe	Firmware update
Magenta (red-purple)		Solid	Idle, serial port connected, not software ready
Blue-green		Solid	Idle, serial port connected, software ready
Yellow		Solid	Plate ejector in motion or open
Yellow		Strobe	Plate ejector obstruction
Blue		Solid	Plate imaging
Blue		Pulse	Transilluminator/focus imaging
Red		Solid	Fatal error

*Activity Definitions: Solid - Constant light with no flashing or dimming. Pulse - Slow dimming and brightening of the indicator light. Strobe - Rapid flashing of the light

Back

There are 4 features on the back of the Q-View Imager Plus. An on/off switch, a power plug receptacle, the USB cord receptacle, and a label containing the serial number and power specifications for the unit.



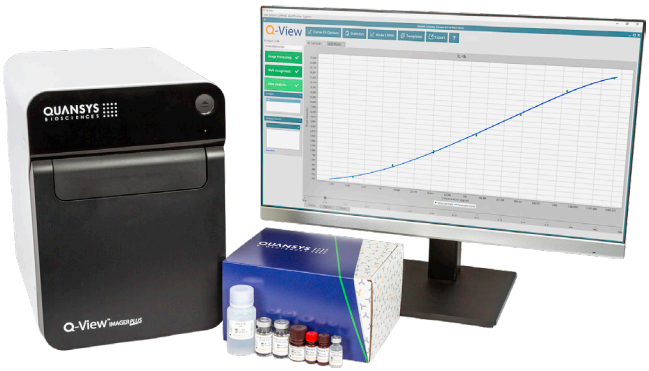
COMPUTER CONNECTION

The Q-View Imager Plus is connected to the PC via a USB 3.0 cable (provided) and should be connected using a USB 3 port. Do not unplug either end of the USB cable without closing Q-View Software on the PC. From within Q-View Software, the user can open Imager Management and see an entry in a table for the Q-View Imager Plus with 1 of the columns saying "connected" or "disconnected."

Q-VIEW SOFTWARE INTRODUCTION

A copy of Q-View Software will accompany the Q-View Imager Plus. To download and install Q-View Software, request a license key from customer support (sales@quansysbio.com). You may also request a copy of Q-View Software from: quansysbio.com/request-software.

Please contact our technical support staff at support@quansysbio.com for more assistance with Q-View Software.



Chapter 3: Operation

BEFORE YOU BEGIN

The following procedure is recommended before every use.

1. Clean the top of the plate tray and ensure it is free of debris.
2. Check within Q-View Software that the Q-View Imager Plus is connected to the PC.

CLEANING THE PLATE TRAY SURFACE

If any particulate, liquid, or dried salt residues or smudges are left on the glass of the plate tray, it will adversely affect the quality of the image and the overall quality of your data. This can be cleaned with 70 percent ethanol in deionized water using a lint-free cloth. Do not use scouring cleaners or abrasive pads as this can scratch the glass.

LOADING THE PLATE

Open the plate ejector by pressing the plate ejector button on the front of the imager. Place the Q-Plex™ plate on the plate tray with well A1 in the top left corner of the tray when facing the imager. Press down gently on the plate to ensure the plate is fully inserted and rests flat on the glass for all bottom edges of the plate. Ensure there is no plate seal on the plate and there is only 1 plate on the tray. Press the plate ejector button to close the plate ejector and proceed to imaging.

IMAGING THE PLATE

In Q-View Software, select **Image Processing** and **Acquire Image.** The name of the connected imager should appear in the dropdown box under **Imager.** If the dropdown says, "No Imagers Connected", select **Refresh**. The name of the Q-View Imager Plus will appear, and connection can be made.

Select the **Exposure Time** and **Image Name**. Once these settings are made, click on **Capture Image(s)** and Q-View Software will image the plate that has been inserted.

USING THE QUALIFICATION PLATE

The optional Q-View™ Plus Qualification Plate can be used to qualify the performance of the Q-View Imager Plus over time. This plate has varying thicknesses and allows light from the internal transilluminator to be filtered over the range of detection. Parameters can be determined dynamically by the Q-View Software to determine acceptable levels of performance. Due to the sensitivities of the cameras, qualification ranges are built using a particular qualification plate paired with a particular imager. Qualification plates are not transferable to other imagers unless qualification ranges have been built pairing a single qualification plate to multiple imagers.

The qualification plate also contains a barcode sticker to qualify the on-board barcode reader. Do not remove this sticker from the qualification plate.

To establish qualification plate ranges, in the Q-view software go to **Qualification > Q-View Imager Qualification > Settings,** then click on **Build Ranges**. This takes approximately 5 minutes to complete.

To learn more about the Q-View Qualification Plate, please contact Quansys Biosciences sales or technical support.

TROUBLESHOOTING

To resolve any issue with the Q-View Imager Plus, please contact Quansys Biosciences by calling 1-877-QUANSYS (1-877-782-6797) or send an email describing the issue to support@quansysbio.com. If outside the USA, please contact your Quansys Biosciences distributor for your area. Have your serial number available with a detailed description of the issue. The serial number is located on the label on the back of the device.

TROUBLESHOOTING GUIDE:

Issue	Problem	Solution
Q-View Software is unable to recognize the Q-View Imager Plus	Failure of communication between the Q-View Imager Plus and computer	Ensure power is supplied to the Q-View Imager Plus Ensure the USB cable is connected to both the Q-View Imager Plus and a **USB 3 port** on the computer Disconnect the Q-View Imager Plus USB cable from the computer and restart the computer
Plate images are blurry	The Q-View Imager Plus is out of focus	Contact Quansys Biosciences for assistance.

Appendix

Q-VIEW IMAGER PLUS SPECIFICATIONS

Resolution:	~35 Megapixels
Pixel Pitch:	1.85 microns
Sensor Type:	CMOS
Sensor Format:	1/1.7
Optics:	Basler C125-1218-5M-P
Image Application:	Chemiluminescent SBS plate format
Imaging Time:	1 second – 300 seconds
Control:	Q-View Software
Connection to PC:	USB 3

OPERATING SPECIFICATIONS

Operating Conditions:	Temperature range of 18-27°C and dew point of no greater than 17°C, non-condensing
Power Requirements:	100-240V AC 50/60Hz 150W
Dimensions:	25.40 W x 29.21 D x 35.56 H cm (10 x 11.5 x 14 inches).
Weight:	13.6 kg (30 lbs)
Overvoltage Category:	OVC II

ACCESSORY PLATES BARCODE NUMBERS

Qualification Plate Barcode Number:

Focus Plate Barcode Number:

Imaging Sensor Alignment Plate Barcode Number:

Q-View™ IMAGER PLUS

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