



Imaging Instruments

Imaging Systems

Imaging systems detect images and quantitate colorimetric, chemiluminescent, and fluorescent signals. Bio-Rad offers software (page 292) that provides automation for image acquisition with data analysis and validation. Refer to the guide below to select the imaging system best suited for your applications.

 [Learn More about the Technology](#)
Web: bio-rad.com/tech/proteinimaging

Imaging System Selection Guide



Application	ChemiDoc™ Touch	ChemiDoc MP	Gel Doc™ EZ	GS-900™ Densitometer	Gel Doc XR+	ChemiDoc XRS+
Nucleic Acid Detection						
Ethidium bromide stain	5	5	4	—	4	4
SYBR® Green I stain	5	5	4	—	4	4
SYBR® Safe stain	5	5	4	—	4	4
Fast Blast™ DNA stain	4	4	4	5	4	4
Protein Detection, 1-D Gels						
Stain-free gels	5	5	5	—	5	5
Coomassie Blue stain	4	4	4	5	4	4
Silver stain	4	4	4	5	4	4
SYPRO Ruby protein gel stain	4	4	4	—	4	4
Flamingo™ fluorescent gel stain	4	4	3	—	4	4
Oriole™ fluorescent gel stain	5	5	4	—	5	5
Protein Detection, 2-D Gels						
Coomassie Blue stain	4	4	3	5	3	3
Silver stain	4	4	3	5	3	3
SYPRO Ruby protein gel stain	4	4	3	—	3	3
Flamingo fluorescent gel stain	4	4	2	—	3	3
Oriole fluorescent gel stain	5	5	3	—	3	3
Pro-Q stain	4	4	2	—	2	3
Cy2, Cy3, Cy5 label	—	4	—	—	—	—
Blot Detection						
Stain-free blots	5	5	5	—	5	5
Coomassie Blue stain	5	4	—	5	4	4
Silver stain	5	5	—	5	4	4
SYPRO Ruby protein blot stain*	—	5	—	—	—	—
Chemiluminescence	5	4/5	—	—	—	4
Chemifluorescence*	1	5	—	—	1	1
Quantum dot*	2	5	2	—	2	2
Multiplex fluorescence	—	5	—	—	—	—
Micro- and Macroarray** Detection						
Radiolabel	—	—	—	—	—	—
Fluorescence	5	5	—	—	2	2
Chemiluminescence	5	5	—	—	—	4
Colony Counting						
Colorimetric detection	5	5	—	—	4	4
Fluorescence detection	5	5	—	—	4	4
Isotopic Detection						
Radiolabel	—	—	—	—	—	—
X-ray film	4	—	4	5	4	4

— Not recommended; 1–5, recommendation level (5 = highest).

* Optimal with low fluorescence PVDF membrane.

** With spot diameters $\geq 400 \mu\text{m}$.

ChemiDoc™ Touch Imaging System

The ChemiDoc Touch imaging system is the most sensitive instrument for protein and DNA gel or western blot imaging. Utilizing a compact design that integrates an intuitive touch screen with a powerful computer, it addresses chemiluminescence detection, stain-free fluorescence, and general gel documentation applications.

The system features best-in-class sensitivity, image quality, and broad dynamic range. The touch-screen user interface running Image Lab™ Touch software is easy to use and learn and optimizes performance for fast, integrated, and automated image capture of various samples.



- **Multiple imaging capabilities** — accommodates a variety of sample types and detection methods, including chemiluminescence and stain-free fluorescence. It is well-suited for protein and DNA electrophoresis runs as well as western blotting experiments, delivering quantitative, reproducible results for fluorescence, chemiluminescence, and colorimetric detection
- **Stain-free technology** — UV-induced fluorescent labeling of proteins in the stain-free gels allows a 2 hr Coomassie gel-staining protocol to be condensed into a 5 min stain-and-image step. Stain-free gels can be used for western blotting. Using the V3 Western Workflow™, you can check your electrophoresis results and protein transfer quality prior to western blotting, and apply total protein loading control in data normalization
- **High-sensitivity blot detection** — offers advanced detection technology that determines optimal exposure, even for faint or intense samples, and achieves superior sensitivity for chemiluminescence and colorimetric gel and blot documentation
- **Superior image quality** — exceptional dynamic range enables visualization of faint and intense bands on same blot or gel. Images are always in focus at any zoom level to ensure publication-ready images in seconds
- **Ease of use** — precalibrated system provides the precise focus for any zoom setting or sample height. Automated hands-free operation ensures consistent, reproducible, and high-throughput performance

For More Information

Web: bio-rad.com/chemidoc touch
Request or download bulletin: 6517

See Also

Stain-free gels:
pages 168, 178,
mini, midi formats
V3 Western Workflow:
page 221.
Trans-Blot Turbo
transfer system:
page 224.

Ordering Information

Catalog #	Description
1708370	ChemiDoc Touch Imager , includes internal computer, 12" touch screen display, camera, Image Lab software, chemi/UV/stain-free sample tray (#1708374); other sample trays available separately
1709690	Image Lab Software , stand-alone software, for 1-D analysis, compatible with PC or Mac
1708381	ChemiDoc Touch V3 Western Workflow for Mini Gels , includes ChemiDoc Touch imager with Image Lab software, UV/stain-free sample tray, 50 Mini-PROTEAN TGX Any kD Stain-Free precast gels, SDS-PAGE accessories, Mini-PROTEAN Tetra cell, Trans-Blot Turbo starter kit, 50 PVDF transfer packs for mini gels
1708382	ChemiDoc Touch V3 Western Workflow for Midi Gels , includes ChemiDoc Touch imager with Image Lab software, UV/stain-free sample tray, 50 4–20% Criterion TGX Stain-Free precast gels, SDS-PAGE accessories, Criterion cell, Trans-Blot Turbo starter kit, 50 PVDF transfer packs for midi gels

Accessories

1708372	White Sample Tray , for gels stained with Coomassie Blue, copper, silver, or zinc stains
1708373	Blue Sample Tray , for gels stained with GelGreen or any SYBR stain
1708374	Chemi/UV/Stain-Free Sample Tray , for chemiluminescent blots, stain-free gels/blots, and gels stained with ethidium bromide, SYPRO Ruby, Oriole, GelRed, and SYBR stains
1708375	UV Safety Shield , to protect against UV light exposure during band excision
1708376	Gel Alignment Templates , for consistent placement of gels and blots
1708377	Holder for ChemiDoc Touch Sample Trays and UV Shield , pkg of 1, holds 3 sample trays and 1 UV shield; trays and shield not included
1708378	ChemiDoc Touch IQ/OQ Protocols , protocols for installation qualification/operational qualification
1708380	ChemiDoc Touch Leveling Feet , ensures level imaging stage

See Also

- Stain-free gels:
pages 168, 178.
mini, midi formats
- V3 Western Workflow:
page 221.
- Trans-Blot Turbo
transfer system:
page 224.

ChemiDoc™ MP Imaging System

The ChemiDoc MP imaging system is a full-featured instrument for gel and western blot imaging. Its flexibility and sensitivity are complemented by simple, intuitive operation that integrates seamlessly into your workflow.

- **Versatility** — can be used for a variety of sample types or experiments that require differing detection methods, including multiplex fluorescence, chemiluminescence, and routine gel imaging, as well as for colorimetric gel and blot documentation
- **Stain-free technology** — eliminates extra steps and allows you to check electrophoresis results and transfer performance before western blotting, conserving precious samples and reducing waste. This technology provides an easy and quick total protein loading control for western blot data normalization
- **Ease of use** — auto focus, auto exposure, and simple operation mean that with little or no training you can acquire publication-quality images in seconds
- **Image quality** — resolution remains high at any zoom level; exceptional dynamic range enables visualization of faint and intense bands on same blot or gel. With Image Lab™ software, you can edit and analyze images on the spot without exporting to other programs
- **Sensitivity** — advanced detection technology creates optimal exposure even for small or faint bands



For More Information

Web: bio-rad.com/chemidoc
Request or download bulletin: 6133

Ordering Information

Catalog #	Description
1708280	ChemiDoc MP Imaging System with Image Lab Software , compatible with PC or Mac, includes darkroom, UV transilluminator, epi-white illumination, camera, power supply, cables, Image Lab software
1708283	ChemiDoc MP Red LED Module Kit , for use with applications requiring red fluorophore detection, includes 2 epi-red LED modules, 1 red emission filter
1708284	ChemiDoc MP Green LED Module Kit , for use with applications requiring green fluorophore detection, includes 2 epi-green LED modules, 1 green emission filter
1708285	ChemiDoc MP Blue LED Module Kit , for use with applications requiring blue fluorophore detection, includes 2 epi-blue LED modules, 1 blue emission filter
1708294	ChemiDoc MP IQ/OQ , for use with Image Lab software
1708182	XcitaBlue Conversion Screen , includes view goggles; blue conversion screen for viewing SYBR Green, SYBR Safe, GFP, Flamingo, and other fluorescent gel stains
1708183	XcitaBlue Conversion Screen and Filter , includes view goggles and SYBR Safe filter #1708075; blue conversion screen for viewing SYBR Green, SYBR Safe, and other fluorescent gel stains
1708289	White Light Conversion Screen , for use with ChemiDoc MP, ChemiDoc XRS+, and Gel Doc XR+ systems
1706887	365 nm UV Lamps , 6 replacement bulbs
1708097	Standard 302 nm UV Lamps , 6 replacement bulbs
1708089	Mitsubishi Thermal Printer
1707581	Mitsubishi Thermal Printer Paper , 4 rolls, for use with Mitsubishi printer
1708184	Gel Alignment Templates , pkg of 3, templates for aligning gels and blots, for use with ChemiDoc XRS+, ChemiDoc MP, and Gel Doc XR+ systems

Gel Doc™ EZ Imaging System

The Gel Doc EZ imaging system is a compact, automated system for obtaining publication-quality images and analyzed results with just the push of a button.

Smart Imaging

- **Modular design** — use specific trays for specific applications; clearly defined and color-coded trays eliminate any confusion in usage
- **Flexible options** — purchase only what you want and upgrade when your needs change
- **Simplicity** — create your default protocol once and simply log in to use the tray
- **Image Lab™ software** — automate image capture, analysis, user preferences, and a myriad of other features
- **Completely analyzed results** — obtain high-quality images and analyzed results, including relative MW, quantitation of bands, Excel reports, and PDFs
- **Reproducibility** — user-introduced errors are minimized; rely on the system to give consistent results time after time
- **Stain-free technology** — convert a 2 hr Coomassie staining protocol into a 5 min visualization step, no staining or destaining required



- **Compatibility** — stain-free gels are western blot compatible, allowing you to check electrophoresis results and quality prior to western blotting
- **Publication-quality images** — obtain clean and smooth images that are visually appealing and publication ready
- **Increased image resolution** — get better resolution when images are cropped or zoomed
- **Greater functionality** — no need to export images to another image editing program to change the dpi before importing for publication; define your desired dpi with Image Lab software

For More Information
 Web: bio-rad.com/geldocez
 Request or download bulletins: 5976 and 6088



UV Tray

For use with fluorescent stains such as ethidium bromide, SYBR®, Oriole™ fluorescent gel stain, GelRed, SYPRO Ruby, Coomassie Fluor Orange, and Krypton stains.



White Tray

For use with protein stains such as Coomassie Blue, copper, silver, and zinc stains.



Blue Tray

For use with nucleic acid stains such as GelGreen, SYBR® Green, SYBR® Safe, and SYBR® Gold stains.



Stain-Free Tray

For use with stain-free gels, such as Mini-PROTEAN® TGX Stain-Free™ gels and Criterion™ TGX Stain-Free™ gels, and stain-free blots.

Ordering Information

Catalog #	Description
1708270	Gel Doc EZ Imaging System with Image Lab Software , compatible with PC or Mac, includes darkroom, camera, cables, Image Lab software; stain-free sample tray #1708274; other sample trays available separately
1708277	Gel Doc EZ IQ/OQ , for use with Image Lab software

Gel Doc EZ Sample Trays

1708271	UV Sample Tray , for gels using ultraviolet illumination
1708272	White Sample Tray , for gels stained with Coomassie Blue, copper, silver, or zinc stains
1708273	Blue Sample Tray , for gels stained with GelGreen or any SYBR stain
1708274	Stain-Free Sample Tray , for stain-free gels and blots
1708276	Sample Tray Holder , holds 4 sample trays

Accessories

1707581	Mitsubishi Thermal Printer Paper , 4 rolls, for use with Mitsubishi thermal printer
1708089	Mitsubishi Thermal Printer
1708097	Standard 302 nm UV Lamps , 6 replacement bulbs

See Also

- Protein gel stains:
page 199.
- Nucleic acid gel stain:
page 259.
- Gel analysis software:
page 293.
- ReadyAgarose precast
gel system: page 252.
- Western blotting:
page 221.
- Northern and
Southern blotting:
page 264.

Gel Doc™ XR+ and ChemiDoc™ XRS+ Systems

The Gel Doc XR+ and ChemiDoc XRS+ systems are based on CCD high-resolution, high-sensitivity detection technology and provide application flexibility. Key benefits include:

- Accurate, protocol-driven gel and blot imaging and analysis
- Automated quantitative analysis of protein and DNA samples in seconds
- Wide range of applications with special accessories to preserve sample integrity for downstream research while ensuring user safety
- Publication-quality results

Gel Doc XR+ System

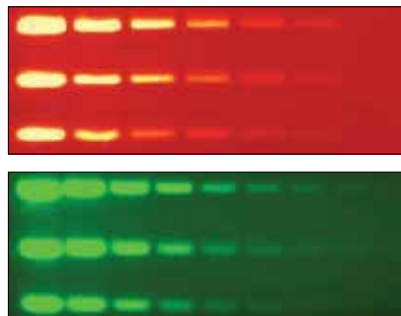
The Gel Doc XR+ system consists of a darkroom hood, CCD camera and software-controlled motorized optics, UV and white light illumination, filter slider with standard filter, and UV-protection shield. The system enables you to:

- Use stain-free technology to rapidly visualize proteins, allowing you to check electrophoresis results and transfer performance before western blotting, conserving precious samples and reducing waste
- Increase cloning efficiency and protein production by protecting DNA electrophoresis samples from UV exposure using the XcitaBlue™ conversion screen and blue light–excitable stains such as GelGreen, SYBR® Safe, and SYBR® Green I
- Maintain standard operating procedures or criteria for sample performance as there is no loss in sensitivity compared to UV and ethidium bromide staining

The Gel Doc XR+ system can be upgraded to the ChemiDoc XRS+ system.

For More Information

Request or download bulletin: 5838



An alternative to UV illumination to better preserve DNA samples. **Top**, serial dilutions of precision molecular mass ruler (Bio-Rad) stained with ethidium bromide (EtBr) on agarose gel imaged with UV light; **bottom**, serial dilutions of precision molecular mass ruler stained with SYBR® Safe stain on agarose gel imaged with XcitaBlue conversion screen. Lane 1 load is 51.2 ng. The Gel Doc XR+ system detects down to 100 pg. There is no loss in sensitivity when a combination of SYBR® Safe nucleic acid fluorescent stain and less harmful blue excitation is used instead of UV-excitable EtBr. The SYBR® Safe image was taken using the XcitaBlue conversion screen and SYBR® Safe/GFP emission filter.

bio-rad.com/imaging**ChemiDoc XRS+ System**

The ChemiDoc XRS+ system offers sensitive chemiluminescence detection in addition to gel and blot documentation of fluorescent and colorimetric samples. The system includes a sensitive 16-bit CCD camera that is cooled for detection of faint samples. The XRS+ system

is now compatible with stain-free technology, which offers checkpoints in western blot experiments and a convenient total protein loading control for data normalization.

For More Information

Web: bio-rad.com/imagingsystems
Request or download bulletin: 5837

See Also

Stain-free gels:
pages 168, 178,
mini, midi formats
V3 Western Workflow:
page 221.
Trans-Blot Turbo
transfer system:
page 224.

Ordering Information

Catalog #	Description
1708195	Gel Doc XR+ System with Image Lab Software , compatible with PC or Mac, includes darkroom, UV transilluminator, epi-white illumination standard filter, camera, cables, Image Lab software
1708193	Gel Doc XR+ IQ/OQ , for use with Image Lab software
1708265	ChemiDoc XRS+ System with Image Lab Software , compatible with PC or Mac, includes darkroom, UV transilluminator, epi-white illumination standard filter, camera, power supply, cables, Image Lab software
1708256	ChemiDoc XRS+ IQ/OQ , for use with Image Lab software

Accessories

1708199	Gel Doc XR+ Installation Kit
1708299	ChemiDoc XRS+ Installation Kit
1708289	White Light Conversion Screen , for use with ChemiDoc MP, ChemiDoc XRS+, and Gel Doc XR+ systems
1708074	Filter , 520DF30, 62 mm, for SYBR Green I/GFP/SYBR Gold/fluorescein stain
1708075	Filter , 560DF50, 62 mm, for Cy3/rhodamine stains
1708076	Filter , 630BP30, 62 mm, for SYPRO Ruby/Texas Red stains
1708081	Filter , standard emission, 62 mm
1706887	365 nm UV Lamps , 6 replacement lamps
1708097	Standard 302 nm UV Lamps , 6 replacement bulbs
1708089	Mitsubishi Thermal Printer
1707581	Mitsubishi Thermal Printer Paper , 4 rolls, for use with Mitsubishi thermal printer
1708183	XcitaBlue Conversion Screen Kit , includes viewing goggles and standard detection filter
1708008	Orange Fluorescence Reference Plate
1703759	Bio-Rad Fluorescent Ruler
1703760	Gel Cutter Ruler
1708184	Gel Alignment Templates , pkg of 3, templates for aligning gels and blots, for use with ChemiDoc XRS+, ChemiDoc MP, and Gel Doc XR+ systems
1708026	Image Lab Focus Calibration Target

See Also

Fluorescent protein gel stains: page 201.

Nucleic acid stain: page 259.

Gel analysis software: page 293.

PharosFX™ and Personal Molecular Imager™ (PMI™) Systems Accessories

Accessories for the discontinued Pharos FX and PMI systems are still available and include replacement filters, external laser upgrades, sample trays, imaging screens, exposure cassettes, and screen erasers. For alternative imaging solutions, please see the imager selection guide (page 280) and ChemiDoc™ MP (page 282) for differential gel electrophoresis needs.

For More Information

Web: bio-rad.com/pharos



Ordering Information

Catalog #	Description
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Accessories for PharosFX and PharosFX Plus Systems

1707896	Filter 640 nm BP, for Texas Red dye
1709459	Filter 530 nm BP, for ECL Plus, AttoPhos, SYBR Green I, Alexa Fluor 488, FITC, Cy2, and Pro-Q Emerald dyes
1707866	Filter 605 nm BP, for ethidium bromide, SYPRO Red, SYPRO Ruby, Alexa Fluor 532 and 546, and Cy3 dyes
1707865	Filter 695 nm BP, for Cy5 and Alexa Fluor 635 dyes
1707863	Filter 555 nm LP, for Texas Red dye
1707867	Blank Filter Holder

Accessories for PharosFX, PharosFX Plus, and PMI Systems

1707811	Sample Tray
1707812	Multi-Sample Tray I, for small aluminum-mounted screens and microplates
1707814	Microplate Adaptor, for multi-sample tray I
1707819	Multi-Sample Tray II, for scanning gels mounted to glass plates

Accessories for PharosFX Plus and PMI Systems

1707843	Imaging Screen-K (Kodak), 20 x 25 cm
1707841	Imaging Screen-K (Kodak), 35 x 43 cm
1707861	Exposure Cassette-K, for 20 x 25 cm Kodak screen
1707862	Exposure Cassette-K, for 35 x 43 cm Kodak screen
1707809	Eraser Screen-K, 110/120 V
1707806	Eraser Screen-K, 220/240 V

GS-900™ USB Calibrated Densitometer

The GS-900 calibrated densitometer delivers superior accuracy, sensitivity, and data reproducibility. To ensure the accuracy of each scan, the GS-900 calibrated densitometer contains an internal optical density tablet, which is scanned and used for calibration before each run. Features include:

- Transmissive and reflective imaging using red, green, and blue CCD technology to optimally scan and quantitate colorimetric blots and gels treated with a variety of stains
- Accurate quantitation of samples over a large dynamic range (up to 3.4 OD) ensuring detection of both highly abundant and dilute proteins
- Scanning of larger gels for enhanced separation of proteins on oversized 29 x 33 cm imaging area
- IQ/OQ kit available for validation of the calibration functions using a NIST-traceable external target to confirm the accuracy of the internal target, guaranteeing accurate and reproducible results
- High resolution and analysis of closest bands on a gel due to 16-bit precision and 36.3 μm resolution
- Sealed imaging area to accommodate wet samples of variable thickness
- Purity analysis and lane background tools for manufacturing QC
- U.S. FDA 21 CFR Part 11 regulation compliance software available



See Also

- Mini-format vertical electrophoresis: page 164.
- Midi-format vertical electrophoresis: page 175.
- Protein standards: page 157.
- QC colloidal Coomassie stain: page 199.
- Image Lab software: page 293.

For More Information

Web: bio-rad.com/g900
 Request or download bulletin: 6385

Ordering Information

Catalog #	Description
1707991	GS-900 Calibrated Densitometry System , PC-compatible calibrated densitometer, cables, Image Lab software, Biologics Analysis Workflow Starter Kit (Criterion cell, Criterion TGX precast gels, Precision Plus Protein standards, QC colloidal Coomassie stain, buffers)
1707993	GS-900 Regulatory Tools Package , includes GS-900 IQ/OQ Kit and Image Lab Security Edition 21 CFR Part 11 module, 1 license
1707994	GS-900 IQ/OQ Kit , set of protocols for installation qualification/operational qualification and NIST-traceable external step tablet for the GS-900 calibrated densitometer

EXQuest™ Spot Cutter Accessories

Accessories for the discontinued EXQuest systems are still available and include cutting tips and sheets, accessories, and calibration tools.



Ordering Information

Catalog #	Description
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Accessories

1657202	Cutting Tip , 1.0 mm
1657203	Cutting Tip , 1.5 mm
1657204	Glass Bottle , 1 L
1657205	Calibration Pucks , 10
1657206	Membrane Cutting Head , with 1.0 mm tip
1657207	Membrane Cutting Tip , 1.0 mm
1657208	Gel Cutting Sheets , 15
1657209	Gel Holding Clips , 2 pair
1657210	Calibration Target
1657211	Camera Target
1657212	Micro Tubes , 1.5 ml, 20
1657214	Bottle Holder
1657215	Gel Tray
1657217	Round-Bottom Microplates , 96-well, 20
1657218	Ferrule , 10–32, 1/16" OD, 10
1657219	Barcode Reader
1709630	PDQuest Advanced 2-D Analysis Software , 1 user license, 2-D analysis software provides advanced functionality

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