User Manual

Gel Imaging System

SCG-W1000 Plus

Please read the instructions carefully and keep them properly
before using the product for future reference.

Wuhan Servicebio Technology Co.,Ltd.

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01 Introduction

SCG-W1000 Plus is a device for imaging detection and analysis of gels, equipped with a high-sensitivity 6.3-megapixel camera for rapid, accurate, and high-throughput detection and imaging of samples. It is widely used in the fields of life sciences, medicine, and environmental protection.

# 02 Technical Specifications and Precautions

Technical Specifications

Product Name		Gel Imaging System
Cat.No.		SCG-W1000 Plus
Dimensions		400×371×700 mm
Camera	**Pixel Resolution**	6.3 million pixels
	Resolution	3072×2048
	Pixel Size	2.4×2.4 μm
	Target Size	1/1.8" (7.37×4.92 mm)
	Full Well Capacity	10.4ke-
	Sensitivity	760mv
	Readout Noise	2.14e-
	Dark Current	0.15mV
	Signal-to-Noise Ratio	40.2dB
	Exposure Time	17us~15s
	Grayscale	8bit (256 levels) or 16bit (65535 levels)
	Camera Type	Color Camera
Lens	**Aperture**	F1.0~F16
	Focal Length	8~48 mm
	Type	Motorized zoom lens
	Close-up lens	2 times
	Filter	590/60nm

Light Source	Bright Field Light Source	Downward-facing LED white light source, symmetrically distributed on both sides
	UV Light Source	310nm LED array with uniform transmitted illumination, 254nm/365nm LED ultraviolet light sources (symmetrically distributed on both sides)
	Dual blue/white light sources	Optional accessories: Blue/white transmitted light switching, each featuring 3-stage power cycling adjustment
Dark Box	Light Isolation	Fully light-sealed, isolates environmental light
	Door Control	Door control sensor can control the on/off of the bright field light source
	Field of View	Effective field of view is 240×240 mm
	Gel Cutting	After opening the door, the UV light source can be pulled out for gel cutting, in conjunction with a UV protection shield
Software Functions	Camera Settings	Auto/Manual adjustment of Contrast, Exposure Time, and Gain
	Lens Controls	Adjustment granularity selection: Coarse/Fine/Ultra-fine tuning Lens functions: Zoom, Focus, Aperture adjustment
	Mode Selection	Nucleic Acid Gel Mode, Protein Gel Mode, Gel Cutting Mode
	Image Tools	Open/Save, Crop, Flip, Rotate, Annotate, Restore, Print
Industrial Computer		10.4" display (1024×768)	Windows 10 OS 16GB RAM, 512GB SSD, Integrated Bluetooth/Wi-Fi
External Interfaces		USB 3.0×2
Operating Voltage		90-132 VAC / 180-264 VAC (selected via switch), 47-63 Hz
Product Power		≤300W
Product Net Weight		30.65Kg

⚠ Notes

- It is prohibited to touch or scratch the internal lenses of the dark box with hands or sharp objects.
- After placing the experimental samples, make sure to close the instrument's flip door to prevent external light from entering the dark box and affecting the experimental results.
- During imaging experiments, shaking the experimental table or instrument is prohibited to avoid impacting the image quality.
- Pay attention to electrical safety. Pulling or moving the power cord during the experiment is prohibited.
- After the experiment is completed, clean the samples and any residues inside the dark box thoroughly.

03 Functional Description

Positive structure   Back structure   Dark fragrance structure   Gel Cutting
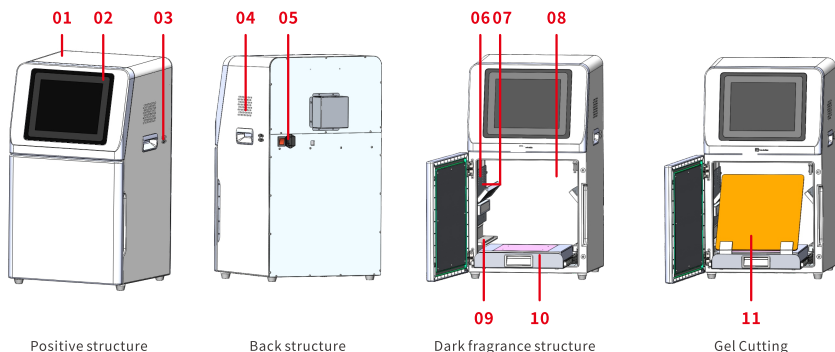
01 Internal camera lens assembly, which is the core component of the imaging system

02 10.4-inch industrial computer with user software operating interface

03 External USB 3.0 interface

04 Cooling device

05 Power socket and switch

06 254nm & 365nm UV Light Sources

07 LED white light source for illumination

08 High-quality light-shielded imaging dark box

09 U-shaped groove , used to hold sample trays that can be taken out for placing protein gels

10 UV light source and drawer

11 UV protection shield

04 Operating Procedures

4.1 Power On

Plug in the power cord and turn on the power switch at the back of the instrument. The industrial computer will start up.

4.2 Sample Loading

Nucleic acid gel: Open the instrument door, place the sample on the UV-transmitting glass of the UV light source module. There are markings on the UV glass surface indicating the sample placement area.

Protein Gel: Open the instrument door, take out the white sample tray, place the prepared text sample on the tray, and then place the tray flat in the groove inside the instrument dark box. Close the instrument door.

4.3 Launching the Imaging Software

Preview and Capture Pages

The preview and capture page includes status display information, camera settings, mode settings, lens settings, image saving and cropping, etc.

The top bar includes UV light source status indicator, keyboard open button, minimize, window restore, exit gel imaging; file path input for saving the location of the image, file name input for saving the name of the image.

The middle window displays real-time images taken by the camera.

The bottom bar includes camera/control board/mobile disk connection status display information, image format selection for saving (TIFF/JPEG/BMP), save image button, open image path, image crop button.

The right sidebar is for camera settings, mode settings, and lens settings area, details are as follows:

Auto Exposure Automatic exposure mode where the camera self-adjusts exposure time and gain

Manual Exposure Manual mode for setting exposure time and gain

Exposure Sets camera exposure time (unit: ms). Increasing exposure time manually brightens images

Gain Adjustable range: 100%-5000%. Higher gain amplifies both signal and noise - avoid excessive settings

Contrast Adjustment range: -100~100 (default: 0)

Nucleic Acid Gel Imaging Auto-activates UV light (door must be closed) Selectable wavelengths: 310/254/365nm

UV-310 Toggle UV light (door-locked operation) for nucleic acid gel mode

Gel Cutting Door-open operation only,Activates UV light box automatically.Requires UV shield placement before activation

Protein Gel Imaging Auto-activates white LED strips + lifts filter Supports color imaging

White Light Toggle white LEDs for protein gel imaging

Light General LED lighting operable in all modes

Adjustment Modes Select the adjustment step sizes for the motorized lens's zoom, focus, and aperture

Coarse Adjustment Larger step sizes: zoom step size 200, focus step size 400, aperture step size 200. When the image is completely blurred, coarse adjustment can quickly bring it to a relatively clear state

Fine Adjustment Moderate step sizes: zoom step size 50, focus step size 100, aperture step size 50. After coarse adjustment, fine tuning refines the image to a sharper state

Ultra-Fine Adjustment Smaller step sizes: zoom step size 10, focus step size 25, aperture step size 10. Achieves the sharpest image clarity

Zoom "-/+" buttons adjust FOV

Focus "-/+" buttons adjust clarity
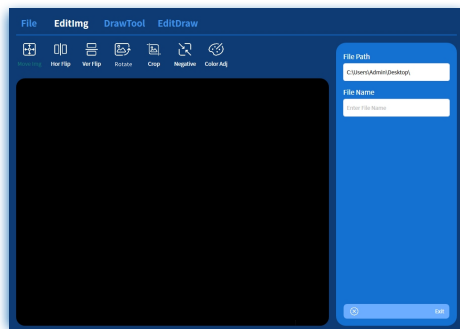
Aperture "-/+" buttons adjust brightness

Image Tool

The image tool interface mainly comprises image manipulation and annotation tools.

1.Image manipulation includes:image cropping,image rotation,horizontal flipping,vertical flipping,image restoration, and image centering.

Crop Click the image cropping icon, select the area of interest in the image, and double-click the image to crop out the selected area

Rotate Click the image rotation icon and draw a red rotation line on the image. The image will rotate along the red rotation line

Hor Flip (Horizontal Flipping) Click the horizontal flipping icon to flip the image horizontally

Ver Flip (Vertical Flipping) Click the vertical flipping icon to flip the image vertically

Image Restoration If dissatisfied with previous image manipulations, click the image restoration to revert the image to its original state

Negative Invert the colors of the image (black and white reversal)

Color Adj(Adjustment) Adjust the brightness, contrast, and grayscale of the image

2.Annotation tools include: tool movement, image movement, rectangle tool, circle tool, line tool, text tool, delete tool, write-in tool, open image, open path, save image, overwrite original image.

Tool Movement Used to move rectangles, circles, lines, and text annotations within the image. Press and drag the desired annotation with the left mouse button. While in this mode, scrolling the mouse wheel can zoom in or out of the image

Image Movement Used to move and scale the entire image. Hold the left mouse button and drag to move the image. While in this mode, scrolling the mouse wheel can zoom in or out of the image

Rectangle Tool Draws a rectangle in the image. Press the left mouse button to set the rectangle's starting point and drag to set the end point

Circle Tool Draws a circle/ellipse in the image. Press the left mouse button to set the circle's starting point and drag to set the end point

Line Tool Draws a line in the image. Press the left mouse button to set the line's starting point and drag to set the end point

Text Tool Adds a text box to the image for inputting text. Clicking the text tool button will display a text editing box at the bottom of the software. Enter text in the editing box, and after completing, drag the text on the image with the mouse

Undo Move Markers Reverse the latest annotation action

Redo Move Markers Reapply the latest annotation action

**Delete Move Markers** In "Move Markers" mode, select a marker and click Delete to remove it

Burn-in Markers Permanently merge annotations with the image (non-editable afterward)

Open Images Load images with preserved annotations

Print Images Access system print dialog for connected printers

Save Images Save annotations separately (editable in software only)

Overwrite Original Enable to replace the source file when saving
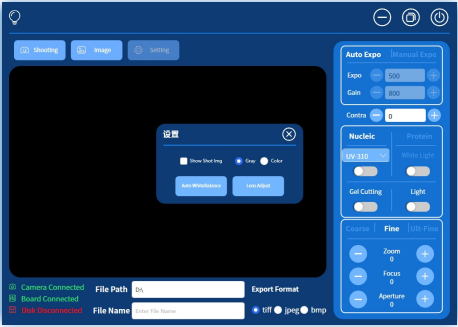
Parameter Configuration Window

Click the blank area to the left of "Export" to open the configuration window. Operators can adjust the following settings:

Show Shot Img When enabled: Automatically switches to the image editing interface after capture. When disabled: Remains in preview mode for continuous image capture

Auto White Balance When protein gel colors appear inaccurat. Remove all samples from the white sample tray. Click to perform camera white balance calibration

Gray/Color Mode Chose Gray, Displays protein gel images in grayscale. Chose Color, Displays protein gel images in full color

Lens Adjust Click to reset all lens adjustment values to zero, providing a reference point for tracking the number of adjustment steps made during operation

4.4 Shooting Process

1.Select automatic exposure, default contrast is 0, default exposure is 500 Max., and default gain is 800 Max.;

2.For nucleic acid gel: Click Nucleic Acid Gel Shooting, turn on the UV light source, then the bands can be seen in the window;

   For protein gel: Click Protein Gel Shooting, turn on the bright field light source, then the bands can be seen in the window;
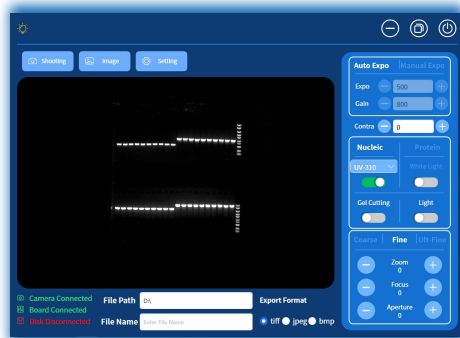

Nucleic Acid Gel Shooting Settings

Protein Gel Shooting Settings

3.Adjust the "zoom" to fill the field of view with bands, or adjust to the experimenter's desired field of view;

4.If the exposure time and gain have reached their default maximum values but the bands remain too dark, adjust the "Aperture" by clicking "+" until the band brightness is satisfactory;

5.In Fine Adjustment mode，adjust "Focus" to achieve optimal image clarity (sufficient for most cases) In rare cases where Fine and Ultra-fine adjustments still don't provide sufficient clarity,decrease the "Aperture" setting Readjust focus to obtain the sharpest possible image;

6.Enter the file path and file name, click "Save Image" to save the current image;

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4.5 Gel Cutting

1.Open the instrument door, the UV light source will automatically turn off;

2.Pull out the drawer of the UV light source, place the UV protective shield diagonally between the drawer and the instrument to shield the eyes from the UV light source;
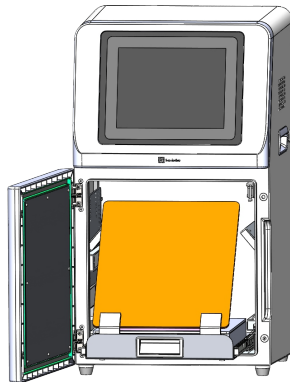
Get Cutting

3.Click on "Gel Cutting" the UV light source will turn on. At this point, the bands of the nucleic acid gel can be observed, and the gel cutting action can be performed.

4.6 Optional Blue/White Light transilluminator

1.Power the Blue/White Light transilluminator;

2.For nucleic acid gel imaging.Place the gel on the sample tray.Position the tray on the imager platform.Press the "Blue Light" button to observe nucleic acid band patterns.

Blue/White Light transilluminator

05 Product Packing List

No.	Name	Specifications	Quantity
1	Gel Imaging System	SCG-W1000 Plus	1
2	Sample Tray		2
3	UV protective shield		1
4	Mouse		1
5	Power Cord	250V-10A	1
6	Certificate of Conformity		1
7	User Manual		1

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06 Warranty and Service Description

If any damage occurs to the instrument or components during the warranty period, our company is responsible for free repair or replacement of the damaged parts.

The following damages are excluded:

Damages caused by improper use.

Repairs or modifications not performed by our company.

Replacements made using non-original or unauthorized parts.

If you need more services, please visit Servicebio official website (https://www.servicebio.com/) or Email to info@servicebio.com.

Please fill in the following warranty card information carefully and keep it properly when purchasing the product.

Product Name	
Cat.No.	
Date of Purchase	
Address	
Product Number	
Quality Feedback	

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