

SmartView Simple Imager System

Instruction Manual

Catalog No. MUV-IMG-CA
MUV-IMG-CA-01



www.majorsci.com
service@majorsci.com

Version 10F
Revised on :2023.07.13

Packing List

MUV-IMG-CA

- 1 × Canon EOS M200 Digital Camera Package
(Includes all accessories and manuals)
- 1 × Memory Card
- 1 × Darkroom
- 1 × SmartView Simple Imager Instruction Manual

MUV-IMG-CA-01

- 1 × Camera Adapter
- 1 × Darkroom

Signed by:

Date:

Major Science is liable for all missing or damaged parts / accessories within 7 days after customer received this instrument package. Please contact Major Science immediately regarding this issue. If no response within such time period from consignee party, that will be consignee party's whole responsibility.

Table of contents

PACKING LIST	1
WARNING	4
SECTION 1 INTRODUCTION	7
1.1 Overview	7
1.2 Features	7
1.3 Components guide	8
SECTION 2 TECHNICAL SPECIFICATIONS	9
SECTION 3 INSTALLATION INSTRUCTIONS	11
3.1 Pre-install the Camera	11
3.2 Mount the Camera	12
SECTION 4 SET THE CAMERA	14
4.1 Turn on the Camera	14
4.2 Setting M Mode and Each Parameter	15
4.3 Set Shutter Speeds & Aperture Values ([M] Mode)	17
4.4 Condition Settings	17
SECTION 5 OPERATION INSTRUCTIONS	18
DNA Sample Imaging	18
Protein Sample Imaging	20
Western Blot	20

5.4 Radiographic Film..... 21

Sample Imaging 21

SECTION 5 TROUBLESHOOTING GUIDE AND MAINTENANCE 22

SECTION 6 ORDERING INFORMATION..... 23

SECTION 7 WARRANTY..... 24

DOMINIQUE DUTSCHER SAS

Warning

Major Science SmartView Simple Imager System is RoHS compliant to deliver confident product which meet the environmental directives. These limits were designed to provide reasonable protection against harmful interference when the device is operated in a commercial environment. This device can generate, use, and radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the device. It is strongly recommended for the user to read the following prints carefully before operating this device:

1. Read and follow the manual instructions carefully.
2. Do not alter the device. Failure to follow these directions could result in personal and/or laboratory hazards, as well as invalidate device warranty.
3. Use a properly grounded electrical outlet with correct voltage and current handling capacity.
4. Refer servicing to qualified personnel.
5. If solution is accidentally spilled on the instrument, disconnect grounded plug and carry out appropriate decontamination measures. For instance, turn the instrument upside down to avoid solution contacting the internal components. Remove bottom cover and inspect to assure solution has not contacted inner components or connectors. Replace damaged parts accordingly.
6. Do not use in the presence of flammable or combustible material, fire or explosion may result. This device contains components which may ignite such material.
7. Refer maintenance and servicing to qualified personnel.
8. The instrument is intended for scientific research use only, and must be operated by qualified personnel who realize the potential risks of the use of this instrument. Major Science makes no claim that its instruments are designed or certified as medical device; no presentation, promises, express warranty or implied warranty will be made concerning the suitability of these instruments for any medical use. Major Science will not provide customers any notice or certification concerning its products being compliant as a medical device.

Safety Information

Use high level of precaution against any electrical device. Before connecting the electrical supply, check to see if the supply voltage is within the range stated at the rating label, and see to it that the device be seated firmly. Place the device in a safe and dry location; it must NOT touch the surrounding. Follow the safety precautions for chemicals / dangerous materials. If needed, please contact qualified service representative or service@majorsci.com

Environmental Conditions

Ensure that the instrument is installed and operated strictly under the following conditions:

1. Indoor use only
2. $\leq 95\%$ RH(non-condensing)
3. 75 kPa – 106 kPa
4. Altitude must not exceed 2000 meters
5. Ambient to 40°C operating temperature
6. Pollution degree: 2
7. Mains supply voltage fluctuations up to $\pm 10\%$ of the normal voltage

Avoiding Electrical Shock

Follow the guidelines below to ensure safe operation of the device.

The SmartView Simple Imager System has been designed to utilize shielded wires thus minimizing any potential shock hazard to the user. Major Science recommends against the use of unshielded wires.

To avoid electrical shock:

1. In the event of solution spilling on the instrument, it must be dried out for at least 2 hours and restored to NORMAL CONDITION before each operation.
2. NEVER connect or disconnect wire leads from the power jacks when the power is on.
3. WAIT at least 5 seconds after stopping a run before handling output leads or connected apparatus.
4. ALWAYS make sure that hands, work area, and instruments are **clean and dry** before making any connections or operating the power supply.
5. ONLY connect the power supply to a properly grounded AC outlet.

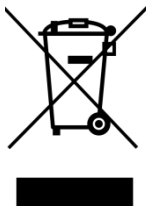
Avoiding Damage to the Instrument

1. Do not attempt to operate the device if it is damaged.

2. Protect this device from physical damage, corrosive agents and extreme temperatures (direct sunlight, etc.)
3. For proper ventilation and safety concerns, keep at least 10 cm of space behind the instrument, and at least 5 cm of space on each side.
4. Do not operate the SmartView Simple Imager System in high humidity environments (>95%), or where condensation may occur.
5. Prior to using any cleaning or decontamination methods other than manufacturer's recommendation, users should check with the manufacturer's instruction to see if the proposed method will damage the device.

Symbols

The symbols used on the SmartView Simple Imager System are explained below:



Indicates disposal instruction

DO NOT throw this device into a municipal trash bin when this device has reached the end of its lifetime. To ensure utmost protection of the global environment and minimize pollution, please recycle this device

Section 1 Introduction

1.1 Overview

The SmartView Simple Imager System offers you convenience and preference. The feature of its portable and light design, you are able to carry the equipment with ease. Also, with the compact camera, you can adapt the Imager System to our MS UV Transilluminator , and take pictures of your experiment results and view them directly on the camera screen. Or you can remove the memory card from the camera, and view the pictures on the personal computer for better resolution.

1.2 Features

- Compact and lightweight
- Easy to install, ready to use out of the box
- Use with scientific-grade camera
- Filter interchangeable for flexibility
- Basic gel analysis software included for convenience and immediate result.

1.3 Components guide



▲ Front view



▲ Rear view

Section 2 Technical Specifications

MUV-IMG-CA	
Camera	
<i>* For detailed specification of Canon EOS M200 Camera, please refer to Canon EOS M200 Camera User Guide.</i>	
Model	Canon EOS M200
Camera Type	24.1MP digital camera, Wi-Fi function
Effective Pixels	Approx. 24.1 megapixels (Total Pixels Approx. 25.8 megapixels)
Sensor	22.3 x 14.9mm CMOS sensor
Max. Aperture	f/3.5-6.3 (IS STM Lens)
Shutter Speed	30 - 1/4000 sec (1/3 stop increments), Bulb (Total shutter speed range. Available range varies by shooting mode)
Storage Media	SD memory card, Wi-Fi to PC, Smartphone or Tablet
Computer Interface	Hi-Speed USB (Micro), HDMI(Micro), WiFi connection
Other Interface	HDMI(Micro), Wireless LAN, Bluetooth
Video Out	MP4, Full HD / HD / 4K
Image Resolution	(3:2)6000x4000
Lens	35mm film equivalent to 1.6x the focal length
File Format	Designed rule for Camera File system 2.0
Data Type	JPEG, RAW(CR3 14-bit), RAW+JPEG, simultaneous recording
Weight (body only)	Approx 299g
Operating Environment	0 – 40 °C, 85% or less humidity
Filter (for camera) <i>*Optional, ordered separately</i>	EtBr filter / SYBR Green filter / Amber filter (49 mm)
Darkroom(Hood)	
Darkroom Material	Acrylonitrile Butadiene Styrene (ABS)
Camera Adapter Material	Aluminum
Darkroom Dimensions (W × L ×H)	9.29" x 12.48" x 16.54"


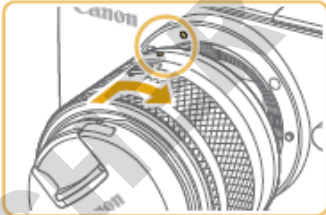
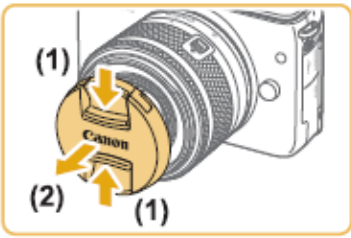
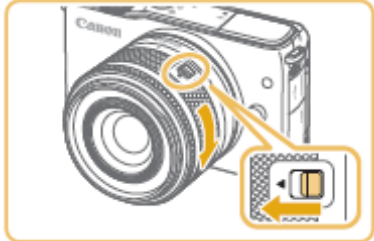
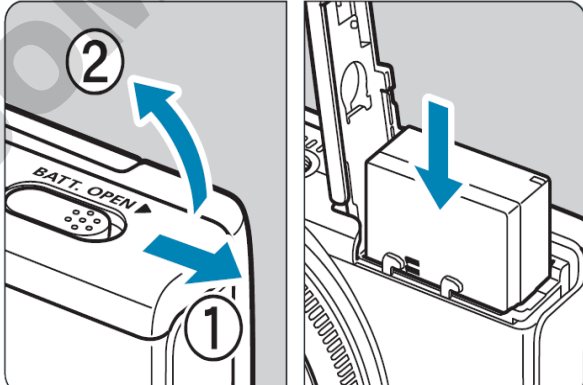

	(236x317x420 mm)
Weight	Approx. 3.1lbs. (1.4Kg)
MUV-IMG-CA-01	
Darkroom(Hood)	
Darkroom Material	Acrylonitrile Butadiene Styrene (ABS)
Camera Adapter Material	Aluminum
Darkroom Dimensions (W × L ×H)	9.29" x 12.48" x 16.54" (236x317x420 mm)
Weight	Approx. 3.1lbs. (1.4Kg)

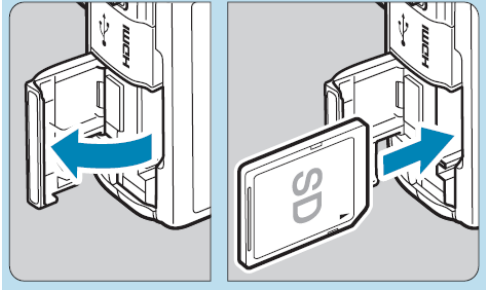


Note: Parts of the contents in this manual are excerpt from Canon EOS M200 Camera user guide. For detailed camera specification and setting, please refer to Canon EOS M200 user guide on Canon official website.

Section 3 Installation Instructions

3.1 Pre-install the Camera


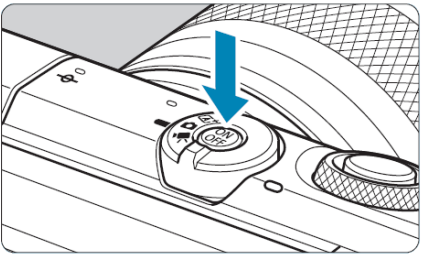
In normal situation, Step 1-5 have been done in the factory before shipping; user could directly jump to Step 6.

<p>1. Make sure the camera is off, and then remove the cap.</p> 	<p>2. Attach the lens. Align the mount index (the white dots) on the lens and camera and turn the lens in the direction of the arrow until it clicks.</p> 
<p>3. Remove the front cap.</p> 	<p>4. Prepare to shoot. Hold the lens retraction switch toward $\langle \blacktriangle \rangle$ as you turn the zoom ring in direction shown and then release the switch. Continue turning the lens until it clicks, it indicates that the camera is ready for shooting.</p> 
<p>5. Insert the battery.</p> 	<p>6. Loose the screw and remove form camera adaptor.</p> 

<p>7. Insert the SD card.</p> 	<p>8. Prepare filter.</p> 
<p>9. Fit and fix the filter on top of the lens.</p> 	<p>10. Fix camera to the camera adaptor on the chamber.</p> 

Note: Make sure you have closed the battery cover properly; otherwise the camera cannot be activated.

3.2 Mount the Camera

<p>1. Fix camera to the camera adaptor on the chamber.</p> 	<p>2. Turn on the camera. It's ready for use.</p> 
---	---

DOMINIQUE DUTSCHER SAS

Section 4 Set the Camera


- ★ In this chapter we provide table of recommended values, and they have already been set before shipping. You can go back and refer to this chapter anytime if you are not sure about the original setting before shipping.
- ★ Some common and most-used settings are provided below. For more detailed table, please refer to 4.2.

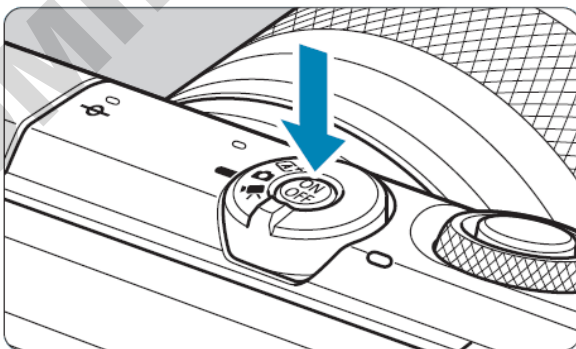
Rec. Mode	M mode
Focus mode	MF
ISO speed	800
Shutter speed	1 sec.
Aperture	F3.5*

*The aperture value may change when you zoom in/out images by rotating the lens. This is a normal situation which every camera would correct aperture itself automatically. You **shall not** enter the setting page and change the aperture yourself.

- ★ If you find the original settings cannot fit your needs--for example, the after-shot picture is too bright (over-exposure) or too dark (under-exposure), please first change the value of shutter speed. Shorten shutter speed for too bright picture; prolong shutter speed for too dark picture. If it still cannot meet your requirement, then consider change the ISO sensitivity. Lower ISO value for too bright picture; enhance ISO value for too dark picture.

4.1 Turn on the Camera

Press the power button to turn on the camera. Switch the mode dial to .



4.2 Setting M Mode and Each Parameter













This camera has three custom modes which could be selected via Mode Switch. They are **Movie Mode** [🎥], **Hybrid Auto Mode** [📷], and **Scene Intelligence Mode** [A+] from left to right. We suggest switch the mode dial to **Hybrid Auto Mode** [📷] and set **M mode** for black& white photo.

1. Use the mode dial to switch to [📷] mode.



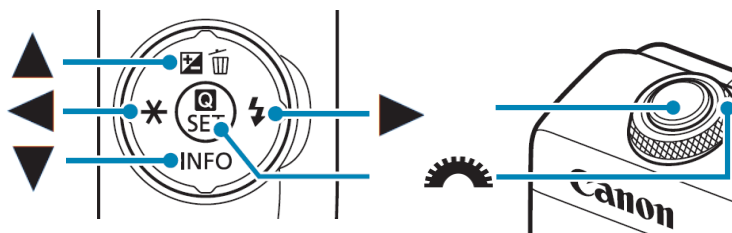
2. Press **MENU** button to enter **Change Shooting Settings** and set the recommended parameter value as follows:

	Menu Item(📷SHOOT)	Setting	
1	Shooting mode	M	
	Image quality	📷L	
	Still Image Aspect Ratio	16:9	
	Image review	2 sec.	
	Lens aberration correction		
	Peripheral illum corr	OFF	
	Distortion Correction	ON	
	Digital Lens Optimizer	ON	
	Flash Control		
	Flash firing	🔋	
	E-TTL II meter.	Evaluative	
	Red-eye reduc.	Enable	
	Slow synchro	1/200 -1/60 A	
	Build-in flash settings		
	Flash mode	E-TTL II	
	Shutter sync.	1st curtain	
	exp. comp.	📷±0	
2	Drive mode	Single shooting(☐🔌OFF)	
	📷ISO speed settings		
	ISO speed	800	

	Max for Auto	25600
	 ISO speed settings	
	Max for Auto	12800
	Auto Lighting Optimizer	Disable 
	Highlight tone priority	OFF
3	Metering mode	<input type="checkbox"/>
	Metering timer	8 sec.
	Expo. simulation	Enable
4	White balance	
	WB correction	0,0
		sRGB
	Picture Style	Monochrome *Monochrome  : for capturing images of DNA gels. *Standard  : for coomassie blue and silver stain protein gels.
5	Long exp. noise reduction	AUTO
	High ISO speed NR	Standard 
	Touch Shutter	Disable
6	AF operation	ONE SHOT AF
	AF method	AF 
	Eye Detection AF	Disable
	Continuous AF	Disable
	Focus mode	MF
7	Lens electronic MF	 OFF
	AF-assist beam firing	OFF
	MF peaking setting	
	Peaking	Off
	Level	High
	Color	Red
	IS setting	
	IS mode	On
 Digital IS	Enable	
8	Movie rec quality	 25.00P 
	Sound recording	Auto
	Movie Servo AF	Enable
	Auto slow shutter	

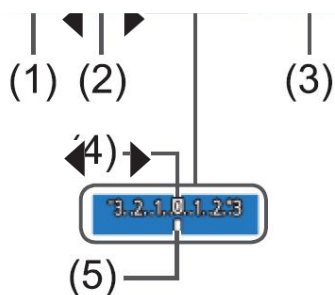
4.3 Set Shutter Speeds & Aperture Values ([M] Mode)

The following camera buttons and controls are represented by icons



I. When in the [M] mode, press the [▲] button, choose adjustment of shutter speed (1) or aperture value (2), and when [⚙️] is displayed, turn the [⚙️] dial to set a value.

II. Touch [] and either touch/drag the bar or touch [] [] to set the ISO speed (3). (When the camera is connected to the TFT screen, press [MENU] and select [ISO Speed] to set a value by press [] [])



III. When the ISO speed is fixed, an exposure level mark (5) based on your specified values is shown on the exposure level indicator for comparison to the standard exposure level (4). The exposure level mark is shown as [◀] or ▶ [] when the difference from standard exposure exceeds 3 stops.



4.4 Condition Settings

Applications	ISO	Exposure Time	Aperture
DNA Sample	800	1" or longer	F3.5
Protein Sample	800	1/100, 1/200, 1/300, ...	F3.5
Western Blot	800	1/10, 1/20, 1/30,	F3.5
Radiographic Film	800	1/100, 1/200, 1/300, ...	F3.5

Section 5 Operation Instructions





The SmartView Simple Imager System provides various applications in gel documentation. Please refer to the operation guide below for detailed instruction.


5.1 DNA Sample Imaging



1. Place gel onto the center of UV transilluminator plate.
2. Put the hood onto UV transilluminator.
3. Turn on camera and adjust the position of hood.
4. Turn on the UV light source.
5. Change the Shutter Speed (1/4000 - 30"). For this application, we recommend setting it to 1" (Factory setting) or longer.
6. Change the metering mode (Evaluative, Spot AE Point, Partial Metering, Center Weighted Avg.). For this application, we recommend setting it to **Center Weighted Avg.** 
7. Change the ISO value (ISO 100-25600 and Auto). For this application, we recommend using ISO 800 to get the highest Signal to noise ratio (Factory setting).
8. Display the magnifying frame. Touch  in the lower right, the magnifying frame is shown. The magnification area and magnified ratio are shown in the lower right.

Step 7-Step 9 can be preset before shooting. Please refer to Section 4 Set the Camera.



9. Select the area to magnify. Drag the frame to move it to an area to magnify.
10. Activate magnification. Touch  to switch to magnification between 1x, 5x, and 10x.
11. Rotate the lens to zoom in and out to focus on the magnified image. Full press the shutter button to take a picture.
12. Press  button and then press  to view the pictures on the memory card full-frame in the monitor. Press  button to view the previous/ next

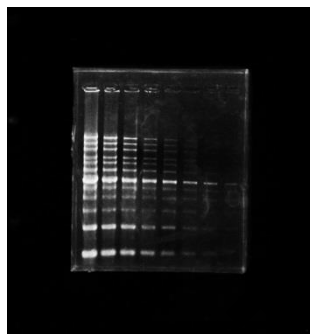
picture. Press  button again to return image shooting mode.

13. Under image viewing mode, press the   button to delete the displayed image.

14. **Finish capturing image, please switch Camera off, and then turn off UV Transilluminator and main power.**

15. Take off hood and remove gel from UV transilluminator.

16. Clean the UV transilluminator and dry the filter area. For more detailed information, please consult the instruction manual of UV transilluminator.



DNA sample imaging example: ISO 400; f/3.5; Shutter speed: 1 Sec.

5.2 Protein Sample Imaging

1. Place gel onto the center of White light plate.
2. Put the hood onto additional White light plate.
3. Turn on camera and adjust the position of hood.
4. Turn on the White light source.
5. Use the mode dial to switch to M (for color photo).
6. Set the aperture fixed on F3.5, change the Shutter Speed from 1/10, 1/20, 1/30.
7. Use the DNA sample imaging procedure (**Section 5.1 step 5 – 13**) for protein sample image capture.
8. **Finish capturing image, please switch Camera off, and then turn off White light plate.**
9. Take off hood and remove gel from White light plate.
10. Clean the White light plate and dry the plate area.

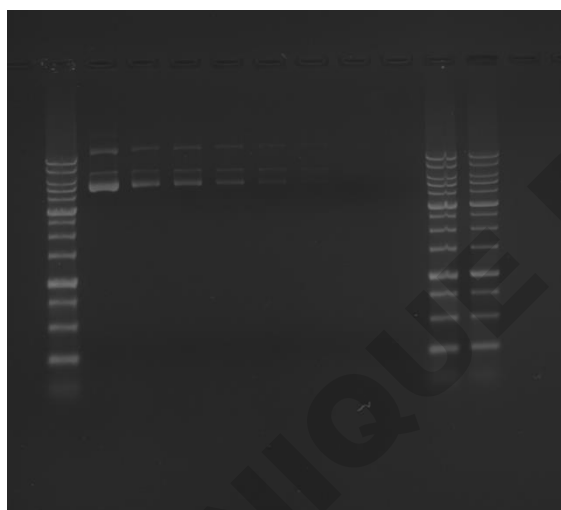
5.3 Western Blot

1. Place gel onto the center of additional White light plate.
2. Put the hood onto additional White light plate.
3. Turn on camera and adjust the position of hood.
4. Turn on the White light source.
5. Use the mode dial to switch to M (for color photo).
6. Set the aperture fixed on F3.5, change the Shutter Speed from 1/10, 1/20, 1/30.
7. Use the DNA sample imaging procedure (**Section 5.1 step 5 – 13**) for protein sample image capture.
8. **Finish capturing image, please switch Camera off, and then turn off White light plate.**
9. Take off hood and remove gel from White light plate.
10. Clean the White light plate and dry the plate area.

5.4 Radiographic Film

1. Place film onto the center of additional White light plate.
2. Put the hood onto additional White light plate.
3. Turn on camera and adjust the position of hood.
4. Turn on the White light source.
5. Use the mode dial to switch to M mode (for Black/White photo).
6. We recommend setting Aperture fixed on F3.5; and the Shutter Speed from 1/100, 1/200, 1/300....
7. Use the DNA sample imaging procedure (**Section 5.1 step 5 – 13**) for protein sample image capture.
8. **Finish capturing image, please switch Camera off, and then turn off White light plate.**
9. Take off hood and remove gel from White light plate.
10. Clean the White light plate and dry the plate area.

Sample Imaging



EtBr

Camera	
Camera maker	Canon
Camera model	Canon PowerShot G15
F-stop	f/1.8
Exposure time	1 sec.
ISO speed	ISO-80
Exposure bias	0 step
Focal length	6 mm
Max aperture	1.6875
Metering mode	Pattern
Subject distance	
Flash mode	No flash, compulsory
Flash energy	
35mm focal length	


Camera setting

Note: The above setting condition is for reference, user can adjust setting according to the sample situation.

For detailed camera operating and setting, please refer to Canon EOS M200 user guide on Canon official website.

Section 5 Troubleshooting Guide and Maintenance

Many operating problems may be solved by carefully reading and following the instructions in this manual accordingly. Some suggestions for troubleshooting are given below. Should these suggestions not resolve the problem, please contact our SERVICE DEPARTMENT or a distributor in your region for assistance. If troubleshooting service is required, please include a full description of the problem.

Problem	Suggestion
The camera cannot be activated	<ul style="list-style-type: none">➤ Check if the camera battery has charged.➤ Check if the battery cover has been closed properly.
Weak signals or no image	<ul style="list-style-type: none">➤ Please first change the value of shutter speed. Shorten shutter speed for too bright picture; prolong shutter speed for too dark picture.➤ If it still cannot meet your requirement, then consider change the ISO sensitivity. Lower ISO value for too bright picture; enhance ISO value for too dark picture.
Unclear Image for the Printed Photos	<ul style="list-style-type: none">➤ Make sure to press the  key first to review the images, and then print the image.

Maintenance

The digital camera should be cleaned with general camera cleaning kit. Dry the filter surface with a soft cloth after each operation. Never use abrasive cleaners, solvent based cleaners, or souring pads.

***Note: Do not cleaning the SmartView amber filter with alcohol.**

Section 6 Ordering Information

MODELS & APPLICATIONS	
Cat. No.	Description
MUV-IMG-CA	SmartView Simple 310 Imager System, with 24.1MP digital camera with built-in WiFi
<i>FILTER (FOR CAMERA) *Optional, Ordered Separately.</i>	
DI-EB49	EtBr optical filter, 49mm
DI-SG49	SYBR Green optical filter, 49mm
DI-AM49	Amber filter, 49mm
Note: <i>For use with UV light as activation source, optical filters should be used. For use with blue light as activation source, amber filters should be used.</i>	
Cat. No.	Description
MUV-IMG-CA-01	SmartView 310 holder kit, includes hood and camera adapter only

PACKAGES	
Cat. No.	Description
MUV21-CP-02	Complete package of MUV21-312 Transilluminator and SmartView Simple 310 Imager System (MUV-IMG-CA).
MUV26-CP-02	Complete package of MUV26-312 Transilluminator and SmartView Simple 310 Imager System (MUV-IMG-CA).
MUVB-111-CP-02	Complete package of SmartView 111 Transilluminator and SmartView Simple 310 Imager System (MUV-IMG-CA).
MUVB-114-CP-02	Complete package of SmartView 114 Transilluminator and SmartView Simple 310 Imager System (MUV-IMG-CA).

Note: *Parts of camera icons in this manual are excerpt from Canon EOS M200 Camera user guide. For more detailed of camera icons, please refer to Canon EOS M200 user guide on Canon official website.*

Section 7 Warranty

Major Science warrants apparatus of its manufacture against defects in materials and workmanship, under normal service, for **one year from the shipping date to purchaser**. This warranty excludes damages resulting from shipping, misuse, carelessness, or neglect. Consumable parts (**UV lamps and the filters**) and the camera (**Canon EOS M200**), including those purchased from Major Science or other distributors, are not covered by our warranty. Major Science's liability under the warranty is limited to the receipt of reasonable proof by the customer that the defect is embraced within the terms of the warranty. All claims made under this warranty must be presented to Major Science within one year following the date of delivery of the product to the customer.

***About the maintenance service of camera, please contact the local Canon Customer Care Center.**

Headquarters:

Major Science Co., Ltd.

Contact Information:

Main Office :

No. 156, Sec. 1, Guoji Rd., Taoyuan Dist.,

Taoyuan City 33061, Taiwan

T/ +886-3-3762878

F/ +886-3-3761310

E-mail : service@majorsci.com, info@majorsci.com