AverVision M90UHD

— User Manual —

WARNING

- To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture. Warranty will be void if any unauthorized modifications are done to the product.
- Do not drop the camera or subject it to physical shock.
- Use the correct power supply voltage to avoid the damaging camera.
- Do not place the camera where the cord can be stepped on as this may result in fraying or damage to the lead or the plug.

- Hold the bottom of the camera with both hands to move the camera. Do not grab the lens or flexible arm to move the camera.

- Do not pull the mechanical arm and camera part in the opposite direction.
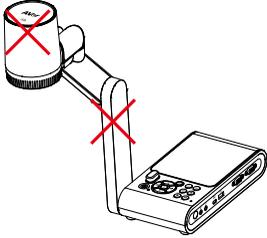
- Do not move the camera head over 110° to avoid camera head wear.

- Do not pull the mechanical arm lower than 60° to avoid camera wear.

110°

60º
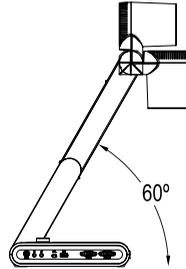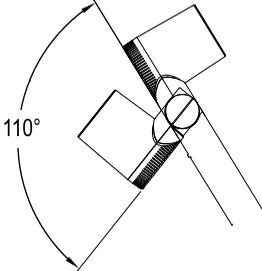
	The mark of crossed-out wheeled bin indicates that this product must not be disposed of with your other household waste. Instead, you need to dispose of the waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. For more information about where to drop off your waste equipment for recycling, please contact your household waste disposal service or the shop where you purchased the product.

Federal Communications Commission

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to pro-vide reasonable protection against harmful interference when the equipment is operate din a commercial environment. This equipment generates, uses, and can radiate radiofrequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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More Help

For FAQs, technical support, software and user manual download, please visit:

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Technical Support:
https://www.aver.com/technical-support

Europe Branch Office
Download Center:
https://www.avereurope.com/download-center

Technical Support:
https://www.avereurope.com/technical-support

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Contents

Overview

Package Contents

M90UHD	Power Adapter Power Cord*	Remote Control**	AAA Battery (x2)
USB Cable	VGA Cable	Warranty Card	Quick Start Guide
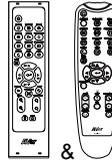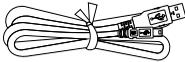
*The power cord will vary depending on the standard power outlet of the country where it is sold.
**Your device may come with one of the two remote controls.

Optional Accessories

Carrying Bag	Anti-glare Sheet	RS-232 Cable
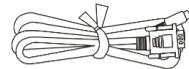
Connecting Plate

Microscope Adapter
(28mm and 34mm Rubber Coupler are included)

Parts Info
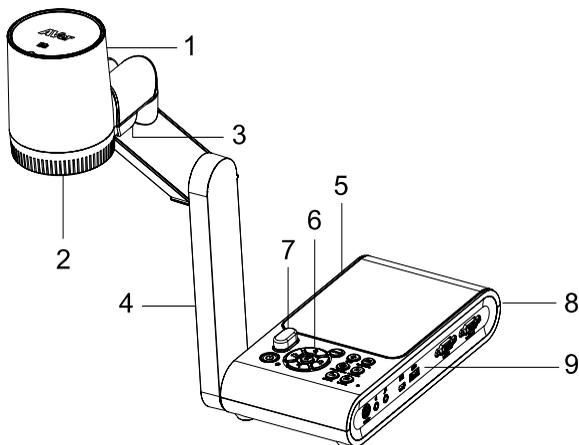
Name	Function
1. Camera head	Contain the camera sensor.
2. Camera lens	Focus the image in the camera.
3. LED light	Provide light to enhance the lighting condition.
4. Mechanical arm	Provide adjustable viewing coverage.
5. Left panel	Micro SD card slot.
6. Control panel	Easy access to various functions.
7. Rear panel	Connections for power, HDMI output/input external display device, and Kensington security lock compatible slot.
8. Right panel	Connections for computer, VGA input/output external display device, and USB Port, Mini USB, MIC in, Line out and RS232 (Optional).
9. IR sensor	Receive remote control commands.

- **Right Panel**
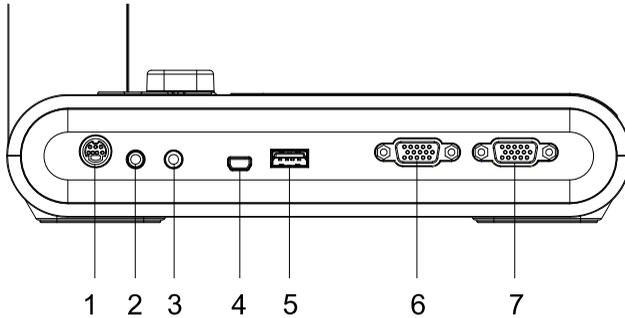
Name	Function
1. RS232 port	Connect this port to a computer by using RS232 cable. For more details, see <**RS232 Diagram Connection**>. (Optional)
2. Line Out port	Connect to an amplified speaker to playback recorded audio & video clip.
3. MIC in port	Connect to an external microphone.
4. USB mini port	Connect to a USB port of a computer with a USB cable and use AVerVision M90UHD as a USB camera or transfer the captured images/videos from the memory source to the computer.
5. USB port	Insert a USB flash drive to save the images/video directly from the USB flash drive.
6. VGA IN port	Input the signal from a computer or other sources and pass it through to the VGA OUT port only. Connect this port to the VGA output port of a computer.
7. VGA OUT port	Connect the AVerVision M90UHD to any display device with VGA cable.

- **Left Panel**
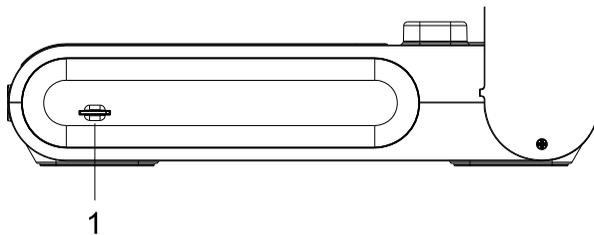
Name	Function
1. Micro SD card slot	Insert the Micro SD card with the label facing up. Micro SD card can save capture image and record video file.

- **Rear Panel**
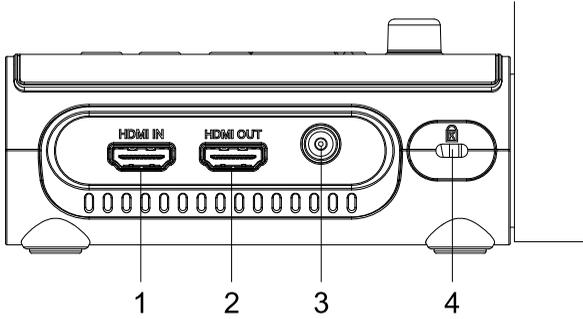
Name	Function
1. HDMI IN port	Connect an external HDMI source as an input via this port. Connect this port to the HDMI output port of a computer.
2. HDMI OUT port	Output the video signal from the main system on an interactive flat panel, an LCD monitor or LCD/DLP projector with HDMI interface using HDMI cable.
3. DC 5V	Connect the power adapter into this port.
4. Kensington Lock	Attach a Kensington compatible security lock or anti-theft device.

Control Panel
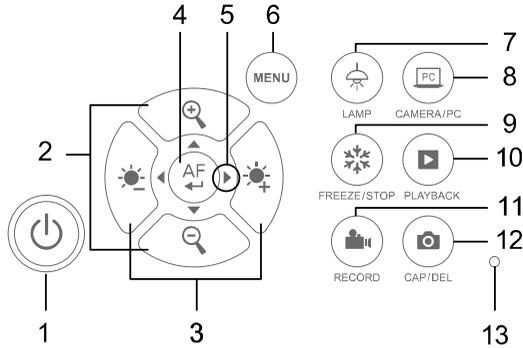
Name	Function
1. POWER	Turn on your device or enter standby mode.
2. ☀- / ☀+	Adjust the brightness.
3. 🔍+ / 🔍-	Zoom in or out.
4. (AF)	• Confirm a selection in Playback mode and OSD menu. • Start/Pause video playback. • Adjust the focus automatically.
5. ▲ ◄ ► ▼	• Pan and tilt control for digital zoom. • Navigate the menu. • Adjust volume. • Fast forward or rewind the video.
6. MENU	Enter and exit the OSD menu and submenu.
7. (☆) LAMP	Turn the lamp on or off.
8. (PC) CAMERA / PC	Switch between the camera live view and the external VGA/HDMI source.
9. (❄) FREEZE/STOP	• Pause or resume image display in Camera mode. • Stop audio & video playback in Playback mode.
10. (▶) PLAYBACK	View & playback captured images and video files.
11. (🎥) RECORDING	Start and stop the audio & video recording. You can only save your recordings on an SD card or a USB Flash drive. For more information, please refer to <**External Memory Storage.**>
12. (📷) CAP/DEL	• Press once to take a snapshot in Camera mode, and press again to stop in continuous capture mode. • Delete the selected picture/video in Playback mode.
13. Built-in MIC	Record audio when recording a video clip. The recorded sound will be in monophonic.

Remote Control

Your device may come with one of the two remote controls.

	Name	Function
1.	⏻ Power	Turn you camera on or off, or enter standby mode.
2.	⏺ Camera	View camera live view.
	▶ Playback	View images and videos from gallery.
	PC 1/2	Switch to external VGA/HDMI source. Press the Camera button ⏺ to switch back to camera live view.
	📷 Capture	Take snapshots and store them on an SD card or a USB flash drive. Open the OSD menu > Settings > Capture Type to switch between Single capture and Continuous capture. • **Single Capture**: Press once to take a snapshot. • **Continuous capture**: Press to start and pause capturing. You may also set up capture interval.
	🎥 Record	Start and stop audio and video recording. Store your recordings on an SD card or a USB Flash drive.
	■ Freeze/Stop	Freeze the camera live view, or stop video playback.
	▭ Visor	N/A
	▣ Spotlight	N/A
	▥ Split Screen	N/A
	↻ Rotate	Flip the camera view.
	⏱ Timer	• Start, pause or stop the timer. • Set the timer interval in OSD menu.
	⣿ Mode	Switch among Normal, High frame, High quality, Microscope, Infinity, and Marco mode.
3.	☰ / 🅼 Menu	Open and close the OSD menu.
4.	▲ ◀ ▶ ▼	• Pan and tilt control for digital zoom. • Navigate the menu. • Adjust volume.
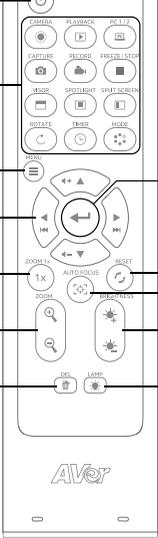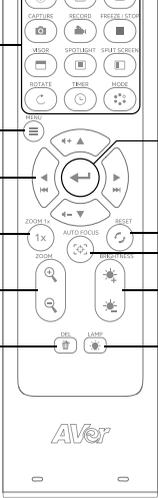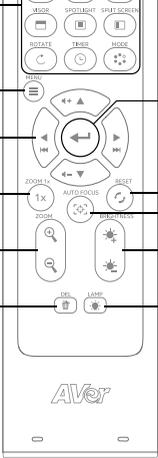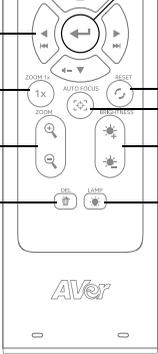
		• Fast forward or rewind the video.
5. ZOOM 1x	Reset zoom ratio to 1x.
6. $\oplus$ / $\ominus$ Zoom	Zoom in or out.
7. 🗑 Del	Delete the selected images or videos.
8. ⟵	• Confirm a selection on the OSD menu. • Play and pause the video.
9. ↻ Reset	Reset to factory default settings.
10. ⟨⟩ / 👁 Auto Focus	Focus automatically.
11. ☀ / ☀ Brightness	Adjust the brightness.
12. ☼ / 💡 Lamp	Turn the lamp on or off.

Connection

Before making the connection, make sure the power of all devices are turned off. If you are not sure where to connect, simply follow the illustrated connections below and refer to the user manual of the device you are connecting to the AVerVision M90UHD.

Power Connection

Plug in power adapter and press "Power" button on control panel to turn on the M90UHD.
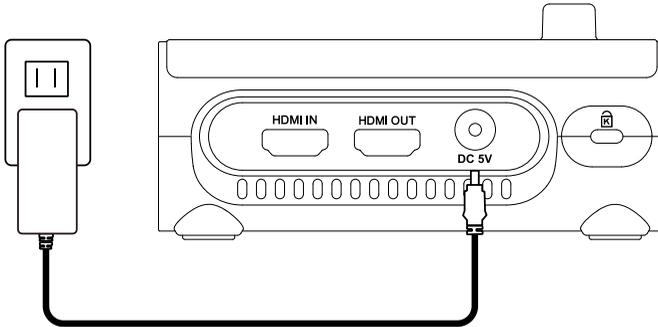
* Wall outlet varies according to your regions

USB Connection

Connect M90UHD with the included USB cable to laptop/PC USB port, and use your device as a USB camera. You may select it as your camera when turning on software like Skype, Teams, Zoom and more.

8
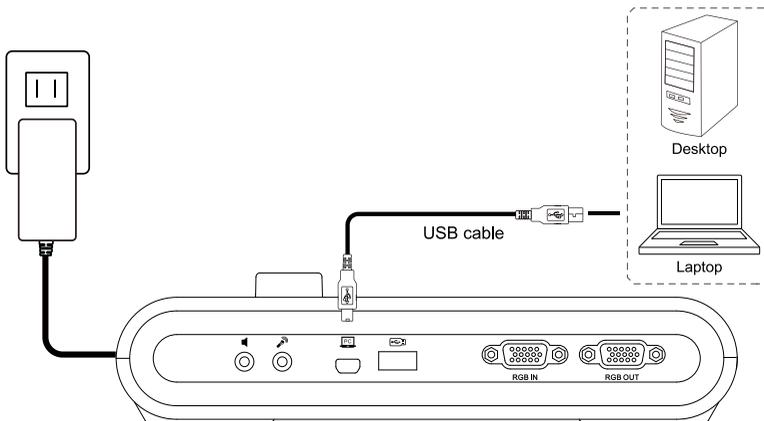
HDMI Out and In Connection

1. Connect M90UHD to HDMI display with HDMI output port.
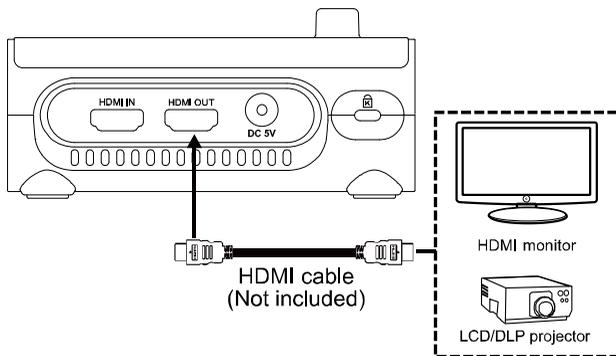
2. Connect M90UHD to laptop/PC with HDMI input port.
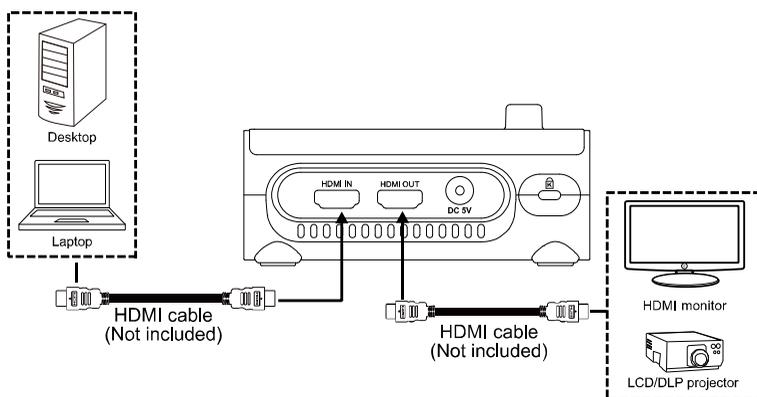
VGA Out and In Connection

1. Connect M90UHD to VGA display with VGA output port.
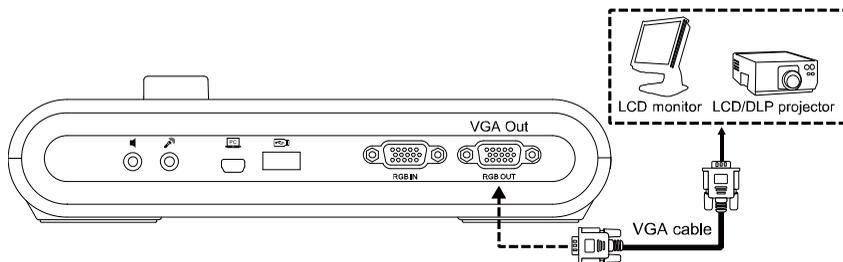
2. Connect M90UHD to VGA display with VGA output port and VGA input source device with VGA input port.
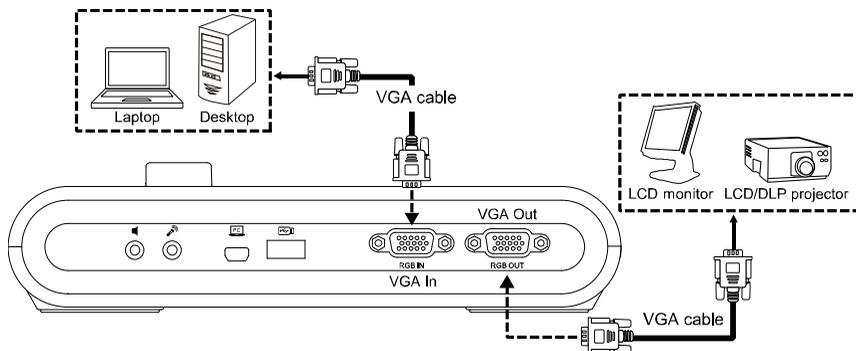
3. Press the Camera/PC button on the control panel or the remote control to display the computer screen.

4. To display the camera live view on your computer, press Fn+F5 on your keyboard to switch output source.

Desktop

Laptop

HDMI IN   HDMI OUT

DC 5V

HDMI monitor

LCD/DLP projector

HDMI cable
(Not included)

HDMI cable
(Not included)
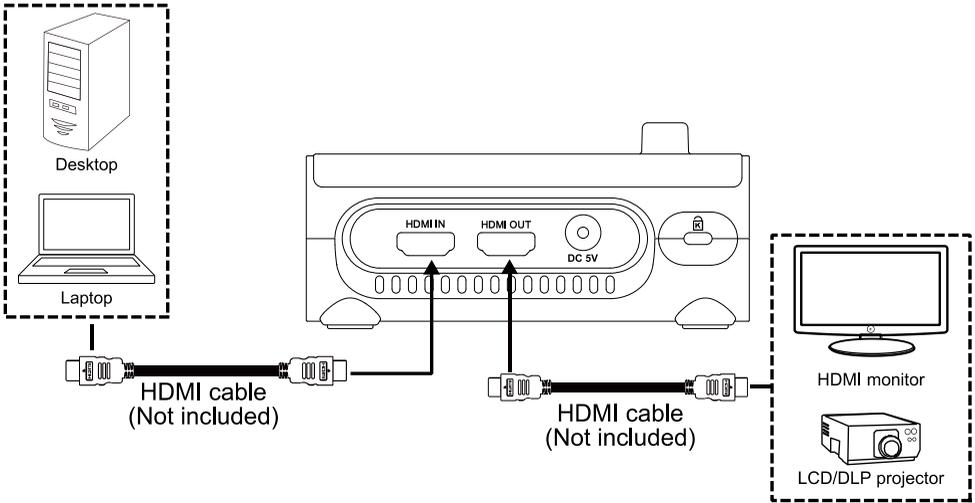
USB to Ethernet Adapter Connection

Connect your M90UHD to your laptop or desktop with a USB to Ethernet adapter (self-purchased accessory) for online control.
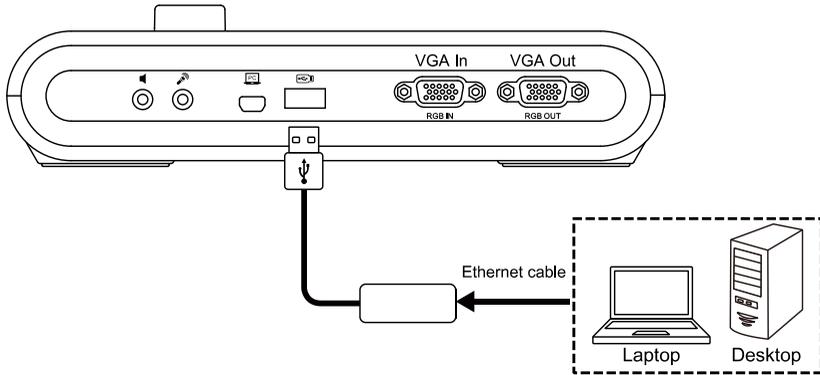
1. Connect the Ethernet cable from your computer to the USB to Ethernet adapter, then insert the adapter to your M90UHD.
2. Press MENU button on the control panel to call out the OSD menu.
3. Go to **System** > **Information** to check your Mac ID and IP Info when successfully connected to the Internet.
4. You may control your device by:
    - Entering IP control commands on a third-party Pocket Sender application;
    - Entering CGI Commands in your web browser.
5. Please refer to <**Appendix**> for IP control protocol and CGI command lists.

Amplified Speaker Connection

Plug a 3.5mm amplified speaker to Line Out (🔊) port. Only the audio from the video playback is supported.

[Note]

We recommend connecting an amplified speaker to the Line out port. Take caution when using earphones. Adjust the volume down on the remote to prevent hearing damage due to loudness.

Amplified Speaker
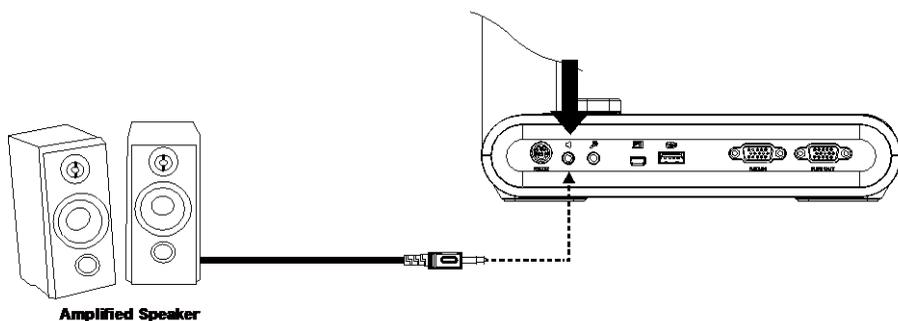
Connect a Microphone

Plug a 3.5mm microphone to MIC In (🎤) port.

Microphone
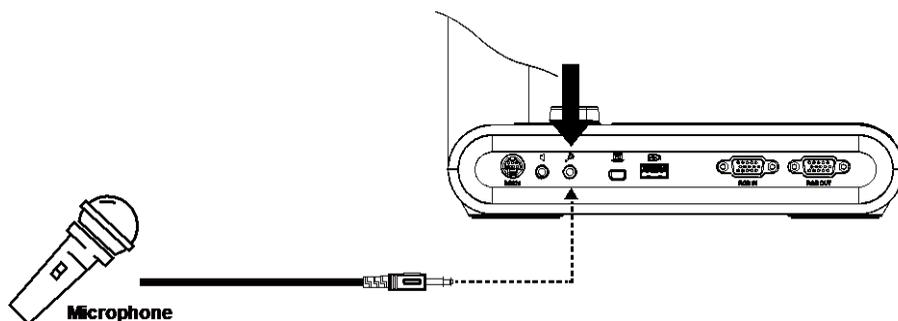
Microscope Connection

Connect the AVerVision M90UHD to a microscope enables you to examine microscopic objects on a big screen.

1. Change the image display mode to Microscope. Select **IMAGE** tab > select **Preview Mode** > select **Microscope** and press ⏎.

IMAGE	Brightness	Normal
SETTING	Contrast	Motion
SYSTEM	Saturation	High Quality
	Preview Mode	Microscope ✓
	Effect	Macro
	Mirror	Infinity
	Exposure Setup	
	Manual Exposure	
	White Balance Setup	
	Manual W.B Blue	
	Manual W.B Red	
	Focus	

2. Aim the camera head at the farthest point and press **AUTO FOCUS**.
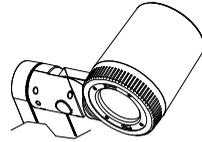
3. Adjust the focus of the microscope.
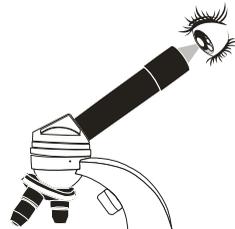
4. Select the appropriate rubber coupler size for the microscope eyepiece and insert it in the microscope adapter.
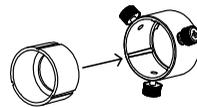
5. Remove the microscope eyepiece from the microscope and connect it to the microscope adapter with the rubber coupler inserted. Fasten the 3 bolts until the adapter secures the eyepiece.

⚠
- For the eyepiece, we suggest using 33mm eye relief or higher.
- Do the adjustment manually to get better image view.

Connecting plate

Microscope adapter

Microscope eyepiece

Microscope

6. Attach the microscope adapter to the AVerVision camera head with a connecting plate. Then connect it to the AVerVision and microscope.

Make sure the arrows on the camera and microscope adapter are aligned and rotated to the left and locked.
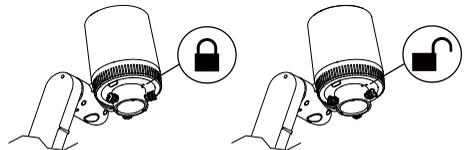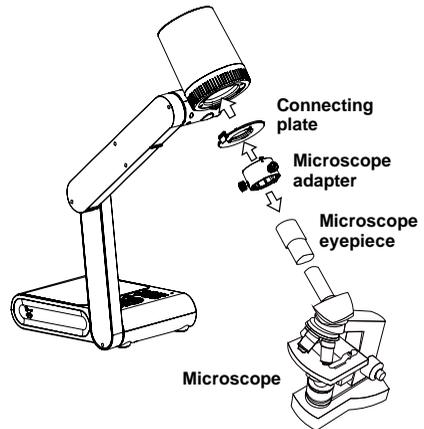
Get Started

This section provides useful tips on how to adjust the AVerVision M90UHD to meet your needs.

Dimension
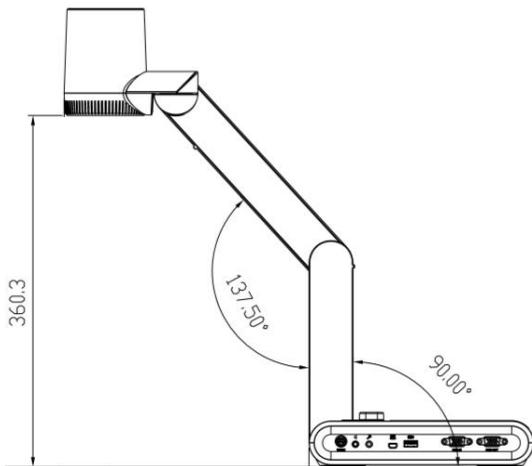
Please follow the below figure to store the document camera.
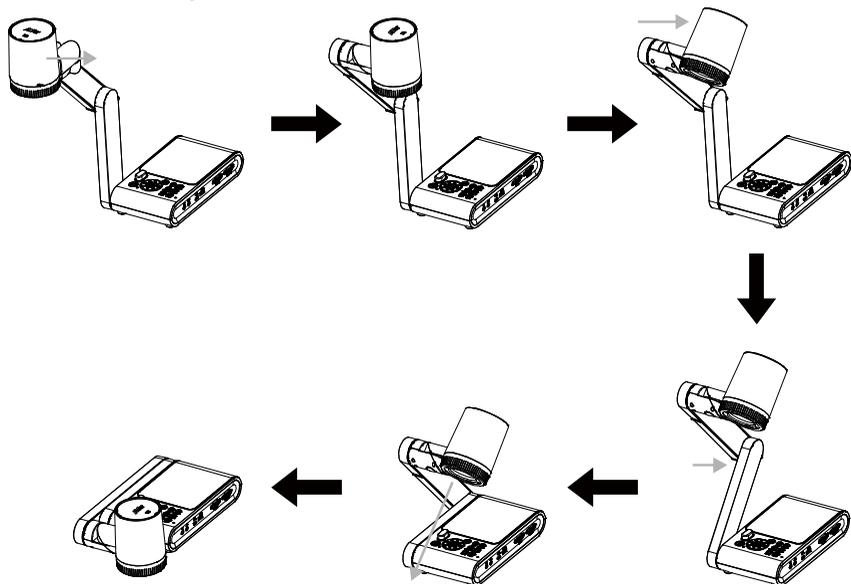
Shooting Area

The shooting area can be viewed an area of 420 x 315mm at High Definition preview mode.
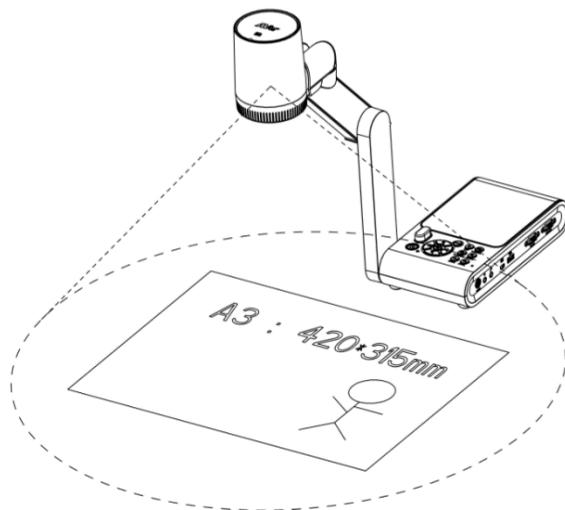
When camera position is 360.3mm high, the shooting area will be A3 size.

The Camera head can be rotated 90° as below figure shown.
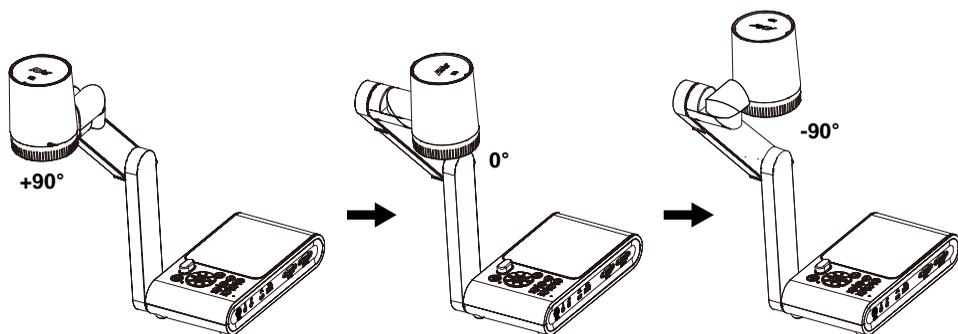
To mirror the image, press **MENU** on the control panel > select **Mirror**, press ⏎, and select "**On**".

Overhead Light

Press LAMP button on the control panel or remote control to turn on and off light.
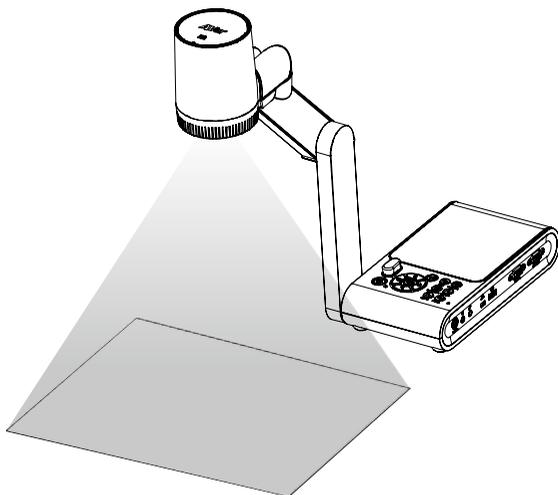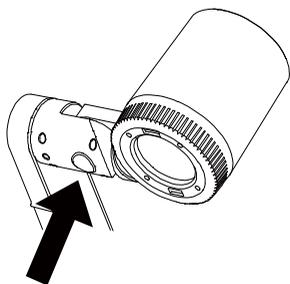
Infrared Sensor

Aim the remote control at the infrared sensor to operate the unit.
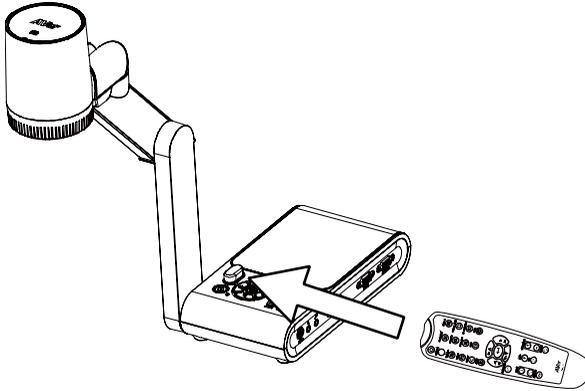
Mounting the M90UHD on a Flat Surface

Measure and mark the horizontal of 75 mm from the center line distance between the holes on the flat surface as describe in the illustration below. Use 2 or 4 pieces of M4.0 screws for 6 mm holes and secure the M90UHD on the flat surface.
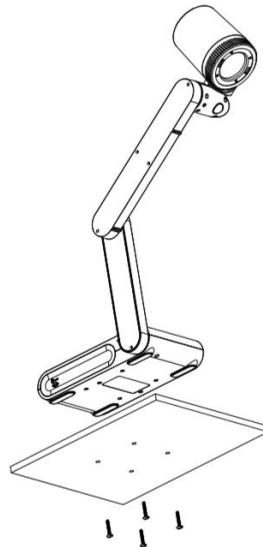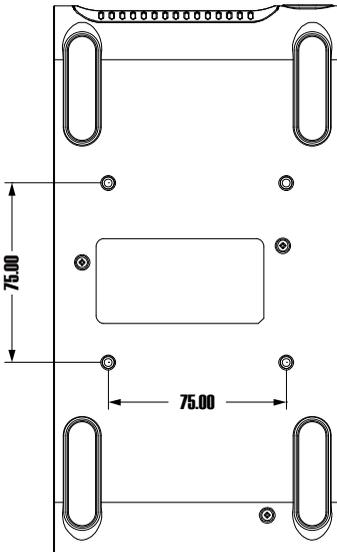
Anti-glare Sheet

The anti-glare sheet is a special coated film that helps eliminate any glare that maybe encountered while displaying very shiny objects or glossy surfaces such as magazines and
pictures. To use, simply place the anti-glare sheet on top of the shiny document to reduce reflected light.
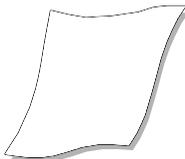
External Memory Storage

AVerVision M90UHD supports both Micro SD memory card and USB flash drive for more image capture and audio & video recordings. AVerVision M90UHD can detect when there is an external storage media and automatically switch to the last detected storage. If no external storage is connected, all captured still images will be saved in the built-in memory.

Insert a Micro SD Card

Insert the card with the contact facing down until it reaches the end. To remove the card, push to eject and pull the card out. The supported Micro SD card capacity is from 1GB to 32GB (FAT32).
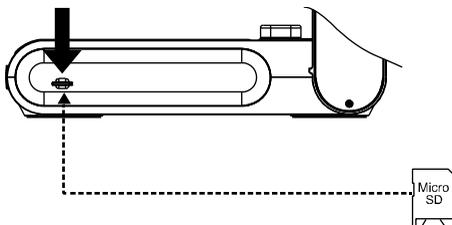
Insert a USB Flash Drive

Connect the USB flash drive in the USB slot. AVerVision M90UHD can support USB flash drive maximum 32GB. **Best to format the USB flash drive using AVerVision M90UHD for better video recording**.

USB Flash Drive
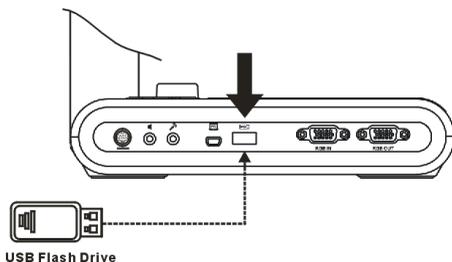
RS232 Diagram Connection

AVerVision M90UHD can be controlled using a computer or any centralized control panel through RS232 connection.
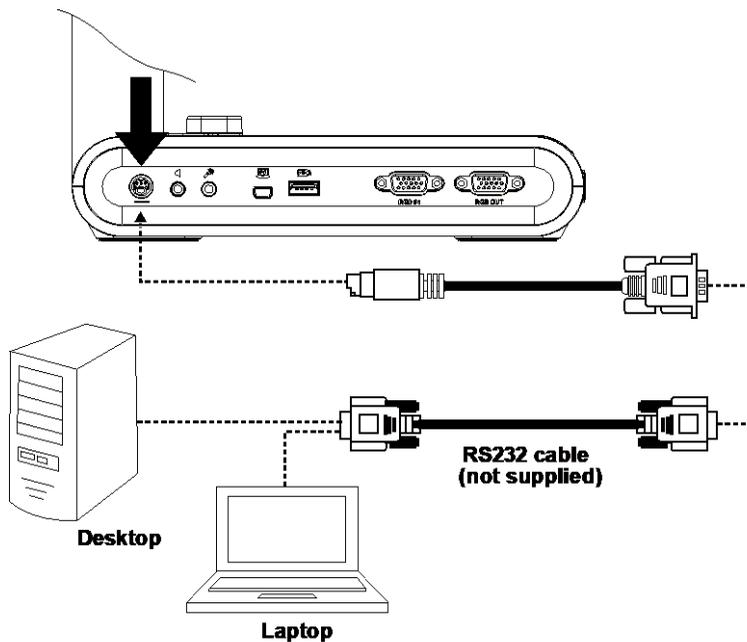
For RS-232 Command list, please refer to <**Appendix**>.

OSD MENU

There are 3 main options on the OSD menu: **IMAGE**, **SETTING** and **SYSTEM**.

IMAGE	Brightness
SETTING	Contrast
SYSTEM	Saturation
	Preview Mode
	Effect
	Mirror
	Exposure Setup
	Manual Exposure
	White Balance Setup
	Manual W.B Blue
	Manual W.B Red
	Focus

IMAGE

IMAGE	Capture Resolution
SETTING	Capture Quality
SYSTEM	Capture Type
	Capture Interval
	Storage
	Format
	USB to PC
	Mic Volume
	Timer
	Timer Interval

SETTING

IMAGE	Language
SETTING	Output Display
SYSTEM	Backup
	Save Setting
	Recall Setting
	Flicker
	Information
	Default

SYSTEM

Navigate the Menu and Submenu

1. Press **MENU** button on the remote or control panel.
2. Press ►, ◄, ▲ and ▼ to choose a selection in the menu list.
3. Press ⏎ to make a selection.
4. Use ▲ and ▼ to adjust the setting or make a selection.
5. Press ⏎ to enter submenu.

Image

Menu Screen	Function
IMAGE / SETTING / SYSTEM — Brightness +, Contrast 125, Saturation −, Preview Mode, Effect, Mirror, Exposure Setup, Manual Exposure, White Balance Setup, Manual W.B Blue, Manual W.B Red, Focus	**Brightness** Adjust brightness level manually between 0 and 255.
IMAGE / SETTING / SYSTEM — Brightness +, Contrast 128, Saturation −, Preview Mode, Effect, Mirror, Exposure Setup, Manual Exposure, White Balance Setup, Manual W.B Blue, Manual W.B Red, Focus	**Contrast** Adjust the contrast level manually between 0 and 255 under bright and dark environments.
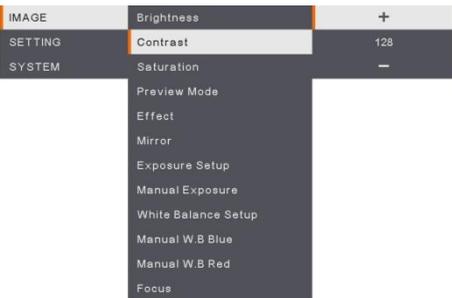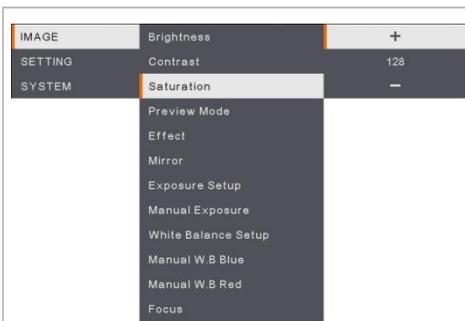
			Saturation
IMAGE	Brightness	+	Adjust the saturation level manually between 0 and 255.
SETTING	Contrast	128	
SYSTEM	Saturation	–	
	Preview Mode		
	Effect		
	Mirror		
	Exposure Setup		
	Manual Exposure		
	White Balance Setup		
	Manual W.B Blue		
	Manual W.B Red		
	Focus		
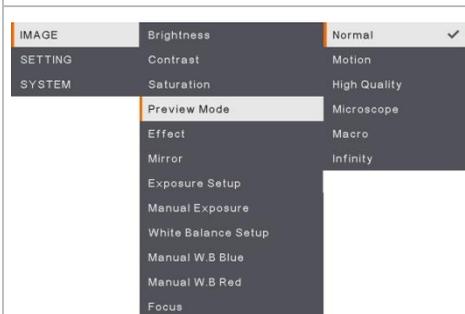
Preview Mode

Select from the various image display settings.
Normal - adjust the gradient of image.
Motion – high refresh rate upon a motion image.
High Quality - high resolution with the best quality.
Microscope - automatically adjust optical zoom for microscopic viewing.
Macro – use for a closer image.
Infinity – use for a farther image.

Menu options shown: IMAGE, SETTING, SYSTEM | Brightness, Contrast, Saturation, Preview Mode, Effect, Mirror, Exposure Setup, Manual Exposure, White Balance Setup, Manual W.B Blue, Manual W.B Red, Focus | Normal ✓, Motion, High Quality, Microscope, Macro, Infinity
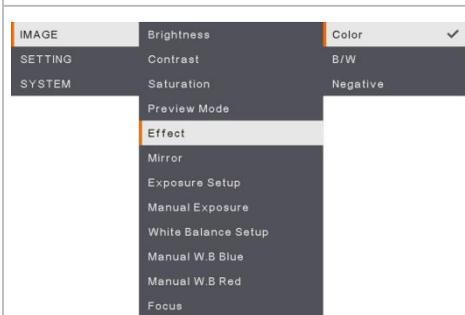
Effect

Convert the image into positive (true color), monochrome (black and white) or negative.

Menu options shown: Color ✓, B/W, Negative
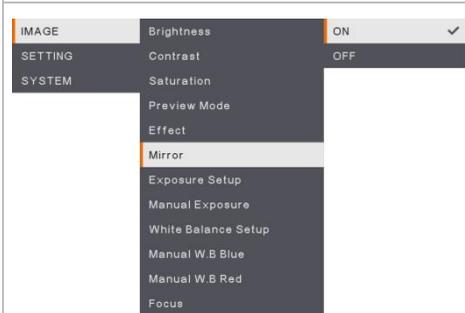
Mirror

Select to flip left and right of the image.

Menu options shown: ON ✓, OFF

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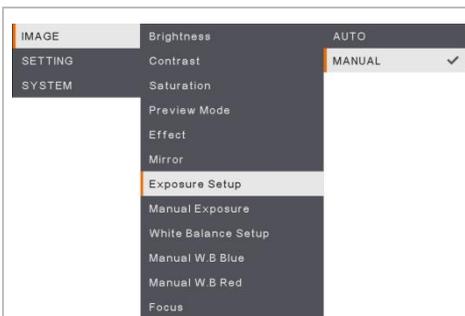
IMAGE Brightness AUTO SETTING Contrast MANUAL ✓ SYSTEM Saturation Preview Mode Effect Mirror Exposure Setup Manual Exposure White Balance Setup Manual W.B Blue Manual W.B Red Focus	**Exposure Setup** Select AUTO to automatically adjust the white balance and exposure setting and correct the color and exposure compensation. Select MANUAL to enable advanced settings for manual exposure and WB.
IMAGE Brightness + SETTING Contrast 99 SYSTEM Saturation − Preview Mode Effect Mirror Exposure Setup Manual Exposure White Balance Setup Manual W.B Blue Manual W.B Red Focus	**Manual Exposure** **MANUAL** - manually adjust the exposure level. The exposure can be adjusted between 0 and 99.
IMAGE Brightness AUTO SETTING Contrast MANUAL ✓ SYSTEM Saturation Preview Mode Effect Mirror Exposure Setup Manual Exposure White Balance Setup Manual W.B Blue Manual W.B Red Focus	**White Balance Setup** Select the White Balance setting for various light conditions or color temperature. **AUTO** - automatically adjust the white balance. **MANUAL** - manually adjust the color level. Select Manual to enable advanced WB setup.
IMAGE Brightness + SETTING Contrast 112 SYSTEM Saturation − Preview Mode Effect Mirror Exposure Setup Manual Exposure White Balance Setup Manual W.B Blue Manual W.B Red Focus	**Manual WB Blue** Manually adjust the blue color level. The color level can be adjusted up to 255.
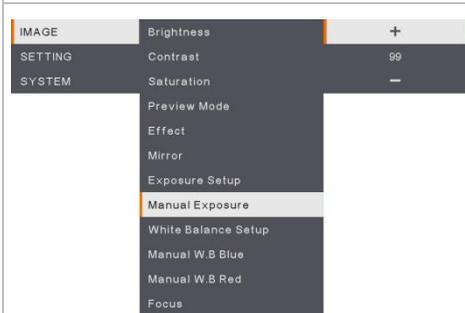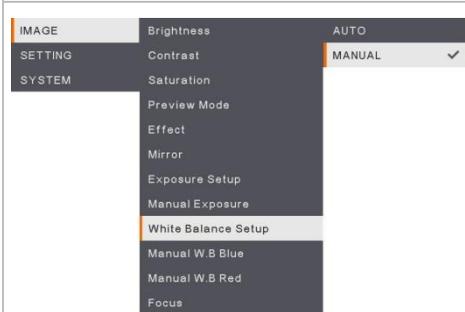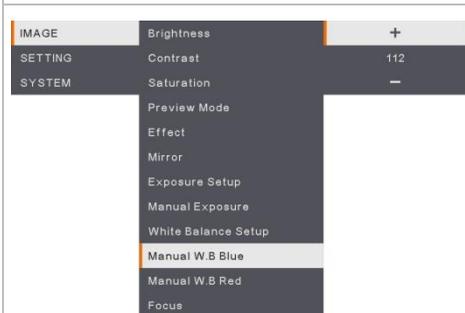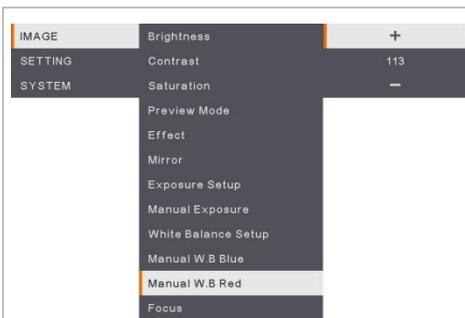
	Manual WB Red Manually adjust the red color level. The color level can be adjusted up to 255.
	Focus Manually fine-tune the image.
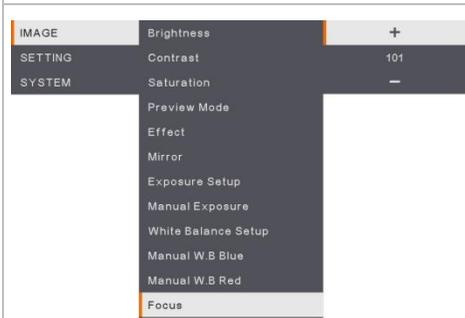
Setting

Menu Screen	Function
IMAGE — Capture Resolution **13M** ✓ / SETTING — Capture Quality Normal / SYSTEM — Capture Type / Capture Interval / Storage / Format / USB to PC / Mic Volume / Timer / Timer Interval	**Capture Resolution** Select the capture size. In **13M** setting, the capture resolution size is 4208 x 3120. Select **Normal**, the capture size is based on the resolution settings.
IMAGE — Capture Resolution **Finest** ✓ / SETTING — Capture Quality High / SYSTEM — Capture Type Normal / Capture Interval / Storage / Format / USB to PC / Mic Volume / Timer / Timer Interval	**Capture Quality** Select the capture compression setting. Select the **Finest** to get the best quality capture compression.
IMAGE — Capture Resolution Single / SETTING — Capture Quality **Continuous** ✓ / SYSTEM — Capture Type / Capture Interval / Storage / Format / USB to PC / Mic Volume / Timer / Timer Interval	**Capture Type** Select the capture type. **Single** - capture one image only. **Continuous** - capture successive images and press any key to stop continuous capture. Select **Continuous** to enable **Capture Interval** setting.
IMAGE — Capture Resolution **+** / SETTING — Capture Quality 1 sec / SYSTEM — Capture Type **–** / Capture Interval / Storage / Format / USB to PC / Mic Volume / Timer / Timer Interval	**Capture Interval** Set the time interval for continuous capture. The length can be set up to 600 sec (10 min).
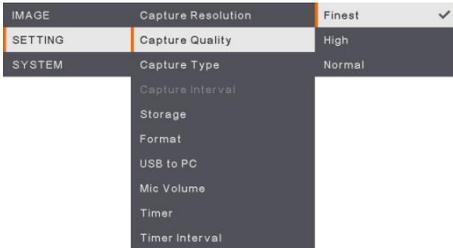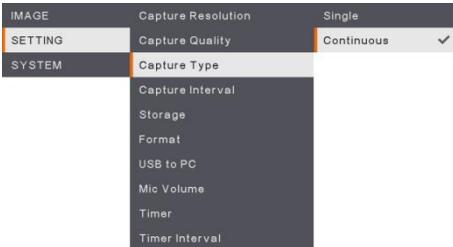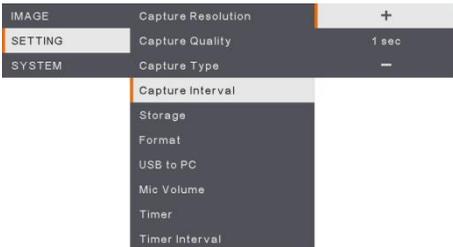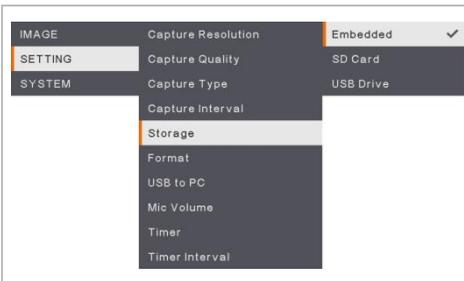
	Storage
IMAGE · Capture Resolution · **Embedded** ✓ SETTING · Capture Quality · SD Card SYSTEM · Capture Type · USB Drive Capture Interval Storage Format USB to PC Mic Volume Timer Timer Interval	Change the storage location. Audio & video recording can only be saved in build-in memory, SD Card or USB Drive.
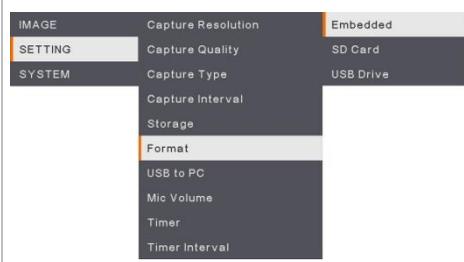
	Format
IMAGE · Capture Resolution · Embedded SETTING · Capture Quality · SD Card SYSTEM · Capture Type · USB Drive Capture Interval Storage Format USB to PC Mic Volume Timer Timer Interval	Format to delete all the data in the selected memory.
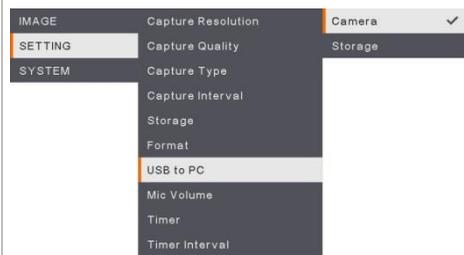
	USB to PC
IMAGE · Capture Resolution · Camera ✓ SETTING · Capture Quality · Storage SYSTEM · Capture Type Capture Interval Storage Format USB to PC Mic Volume Timer Timer Interval	Select status of the AVerVision M90UHD when it is connected to the computer via USB cable. **Camera** - can be used as a computer webcam or with our bundled software to record video and capture still image. **Storage** - transfer the captured pictures/videos from the memory to computer hard disk.

	MIC Volume
IMAGE · Capture Resolution · + SETTING · Capture Quality · 30 SYSTEM · Capture Type · − Capture Interval Storage Format USB to PC Mic Volume Timer Timer Interval	Adjust volume input of recording or USB audio input.

IMAGE	Capture Resolution	Start	**Start Timer**
SETTING	Capture Quality	Pause	Start the timer. The timer automatically counts up after the countdown reaches zero to show the elapsed time.
SYSTEM	Capture Type	Stop	
	Capture Interval		
	Storage		
	Format		
	USB to PC		
	Mic Volume		
	Timer		
	Timer Interval		
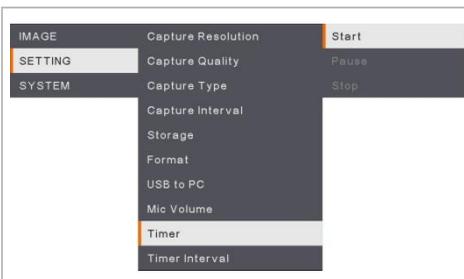
Start Timer

Start the timer. The timer automatically counts up after the countdown reaches zero to show the elapsed time.
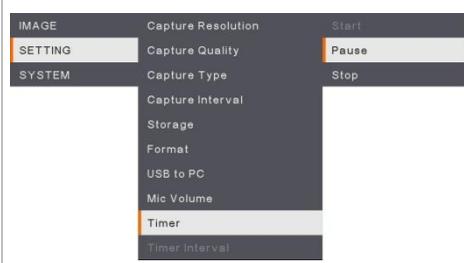
Pause/Stop Timer

Press Menu button during timing to pause or stop timing.

IMAGE — Capture Resolution — Start
SETTING — Capture Quality — Pause
SYSTEM — Capture Type — Stop
Capture Interval
Storage
Format
USB to PC
Mic Volume
Timer
Timer Interval
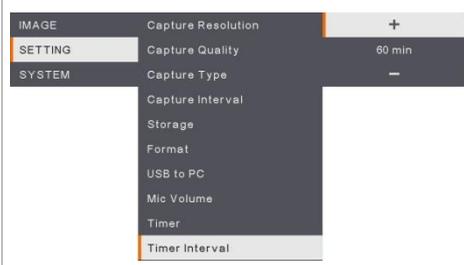
Timer Interval

Set the timer duration up to 2 hours.

IMAGE — Capture Resolution — +
SETTING — Capture Quality — 60 min
SYSTEM — Capture Type — −
Capture Interval
Storage
Format
USB to PC
Mic Volume
Timer
Timer Interval

System

Menu Screen	Function
	Language Change and select a different language. M90UHD supports up to 12 languages.
	Output Display Set the resolution to display the image on screen. The output device resolution detected automatically and configured to the highest resolution.
	Backup Copy the image from the built-in memory to SD card or USB flash drive.
	Save Setting Save current settings (Brightness, contrast, saturation, preview mode and etc.) in the selected profile number.
	Recall Setting Restore the setting back to the selected profile number.
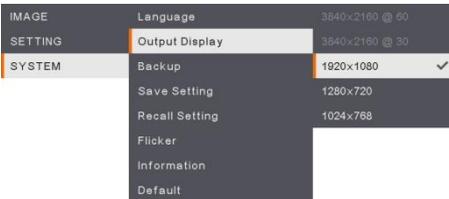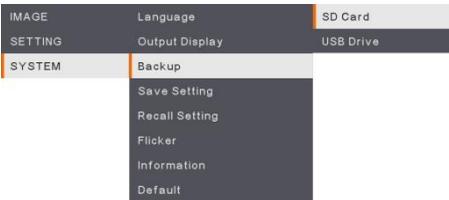
	Flicker
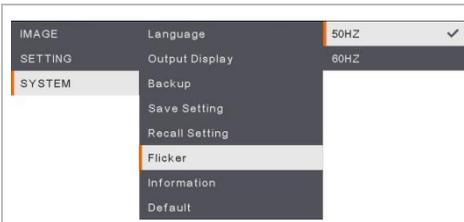
IMAGE   Language   50HZ ✓
SETTING Output Display   60HZ
SYSTEM   Backup
         Save Setting
         Recall Setting
         Flicker
         Information
         Default
	Select between 50Hz or 60Hz. Some display devices cannot handle high refresh rates. The image will flicker a couple of times as the output is switched to another refresh rate.

	Information
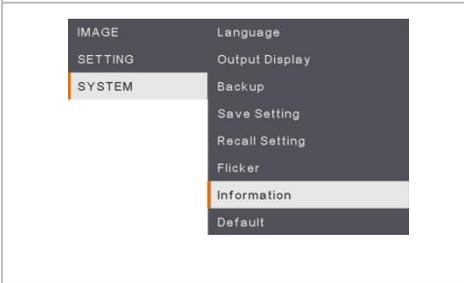
IMAGE   Language
SETTING Output Display
SYSTEM   Backup
         Save Setting
         Recall Setting
         Flicker
         Information
         Default
	Display the product information.
	
	ⓘ About
	
	MODEL M90UHD
	VERSION 5.4.0000.03
	FLASH 080CPM50-FJC 2006291658
	EUP 080CPM50-FJD 2005251500
	AF 080CPM50-FJE 2006081600

	Default
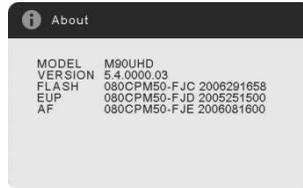
IMAGE   Language   NO
SETTING Output Display   YES
SYSTEM   Backup
         Save Setting
         Recall Setting
         Flicker
         Information
         Default
	Restore all the settings into original factory default setting. All saving configurations will be deleted.

Playback

You can use the playback feature to configure the saved images or videos.

Menu Screen	Function
PLAYBACK — Slide Show (Start / Stop) — Interval — Storage — Delete All	**Slide Show** Start or Stop the Slide Show.
PLAYBACK — Slide Show — Interval (+ / 1 sec / −) — Storage — Delete All	**Interval** Set the interval between playing images or videos.
PLAYBACK — Slide Show — Interval — Storage (Embedded / SD Card ✓ / USB Drive) — Delete All	**Storage** Choose the images or videos from Storage, including Embedded, SD Card or USB Drive.
PLAYBACK — Slide Show — Interval — Storage — Delete All (NO / YES)	**Delete All** Select this option to delete all saved images or videos.

Transfer Captured Images/Videos to a computer

This enables you to transfer the captured image from the built-in memory, SD or USB drive to a computer.

Two ways to save images/videos:

a. Built-in memory+SD card
b. Built-in memory+USB drive

⚠️ The instruction below **MUST** be read and followed **BEFORE** connecting the USB cable.

1. **MUST** set the USB to PC as STORAGE before connecting the USB cable.

IMAGE	Capture Resolution	Camera	
SETTING	Capture Quality	Storage	✓
SYSTEM	Capture Type		
	Capture Interval		
	Storage		
	Format		
	USB to PC		
	Mic Volume		
	Timer		
	Timer Interval		

2. When "**Mass Storage**" appears at the lower right corner of the presentation screen, you may now connect the USB cable.

3. Upon connecting the USB cable, the system automatically detects the new removable disk. You can now transfer the captured image(s) or videos from the **M90UHD built-in memory, SD card or USB drive** to the computer hard disk.

Appendix

IP Command Protocol

- **Port**

Internet protocol	IPv4
Transport protocol	TCP
Port address	9528

- **Format**

The data sent between device control and camera consists of multiple fields. The data in each field are placed in little-endian.

Header Magic Number	4-byte field with the value 0xABCD1234.
Checksum	4-byte field. The value is calculated from the data after the checksum field to the footer.
Command	4-byte field, indicating what to do
Flags	4-byte field, indicating if the command should be replied or not. This field could be either 0x00000000 or 0x00000001. 0x00000001 means it should be acknowledged. The default acknowledgement is just to echo the Command field and set Data Size to 0.
Data size	4-byte field, the length must be an integer multiple of 4
Footer Magic Number	4-byte field with the value 0x5678EF09.
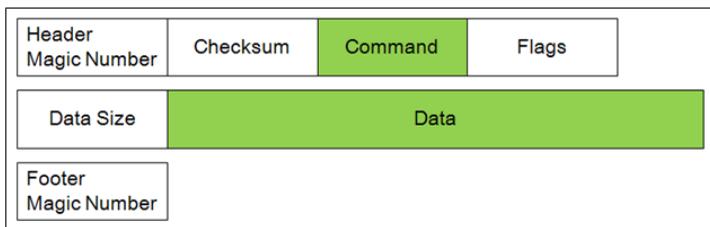

```
* Example for Set Brightness (0x80000207) Value to 100 (0x64)

0xabcd1234  0x8000026F  0x80000207  0x00000000  0x00000004  0x00000064  0x5678ef09
  Header     Checksum     Command      Flags     Data Size     Data        Footer

Checksum    =   Command   +   Flags    +  Data Size  +    Data
0x8000026F  = 0x80000207  + 0x00000000 + 0x00000004  + 0x00000064
```

- **Command and Data**

Function	Command	Data Byte [0 – N]	Description
SET BRIGHTNESS	0x80000207	[0 – 3] 0x00 ~ 0xFF	Setup value from 0 to 255
SET CONTRAST	0x8000020A	[0 – 3] 0x00 ~ 0xFF (0~255)	Setup value from 0 to 255
SET EFFECT	0x8000020D	[0 – 3] 0x00 ~ 0x02	0x00: Color Mode 0x01: White & Black Mode. 0x02: Negative Mode.
SET FOCUS	0x80000211	[0 – 3] 0x00 ~ 0x02 [4 – 7] 0x00 ~ Max Step / Address	[0 – 3] Action Behavior 0x00: Auto Focus (don't need Step) 0x01: Close to Near 0x02: Close to Far 0x03: Set Focus Address [4 – 7] Step/Address Value 0x00 ~ Max Step / Address
SET ZOOM	0x80000212	[0 – 3] 0x00 ~ 0x03	0x00 Zoom In 0x01 Zoom Out 0x02 Zoom Max 0x03 Zoom Reset
SET EXPOSURE MODE	0x80000215	[0 – 3] 0x00 ~ 0x01	0x00 Manual Mode 0x01 Auto Mode
SET EXPOSURE VALUE	0x80000216	[0 – 3] 0x00 ~ 0x63	Setup value from 0 to 99
SET WITE BALANCE MODE	0x80000217	[0 – 3] 0x00 ~ 0x01	0x00 Manual Mode 0x01 Auto Mode
SET WITE BALANCE VALUE (BLUE)	0x80000218	[0 – 3] 0x00 ~ 0xFF	Setup value from 0 to 255
SET WITE BALANCE VALUE (RED)	0x80000219	[0 – 3] 0x00 ~ 0xFF	Setup value from 0 to 255
SET CAPTURE	0x8000021A	/*Don't need*/	Trigger action
SET FLICKER	0x8000021B	[0 – 3] 0x01 ~ 0x02	0x00: Reserved 0x01: 50 Hz 0x02: 60 Hz
SET FREEZE	0x8000021D	[0 – 3] 0x00 ~ 0x01	0x00 Freeze OFF 0x01 Freeze ON
SET ROTATE	0x80000300	[0 – 3] 0x00 ~ 0x01	0x00 Rotate 0 degree. 0x01 Rotate 180 degree
SET LAMP	0x80000301	[0 – 3] 0x00 ~ 0x01	0x00 Lamp OFF 0x01 Lamp ON
SET SATURATION	0x80000302	[0 – 3] 0x00 ~ 0xFF (0~255)	Setup value from 0 to 255
SET PC PASS	0x80000303	[0 – 3] 0x00 ~ 0x01	0x00 PC Pass OFF 0x01 PC Pass ON

- **Example for packet data via internet protocol sender tool.**

Header	Checksum	Command	Flags	Data Size	Data	Footer	Action Description
34 12 cd ab	6F 02 00 80	07 02 00 80	00 00 00 00	04 00 00 00	64 00 00 00	09 ef 78 56	BRIGHTNESS 100
34 12 cd ab	72 02 00 80	0A 02 00 80	00 00 00 00	04 00 00 00	64 00 00 00	09 ef 78 56	CONTRAST 100
34 12 cd ab	11 02 00 80	0D 02 00 80	00 00 00 00	04 00 00 00	00 00 00 00	09 ef 78 56	EFFECT COLOR
34 12 cd ab	12 02 00 80	0D 02 00 80	00 00 00 00	04 00 00 00	01 00 00 00	09 ef 78 56	EFFECT B/W
34 12 cd ab	13 02 00 80	0D 02 00 80	00 00 00 00	04 00 00 00	02 00 00 00	09 ef 78 56	EFFECT NEGATIVE
34 12 cd ab	15 02 00 80	11 02 00 80	00 00 00 00	04 00 00 00	00 00 00 00	09 ef 78 56	AUTO FOCUS
34 12 cd ab	16 02 00 80	12 02 00 80	00 00 00 00	04 00 00 00	00 00 00 00	09 ef 78 56	ZOOM IN
34 12 cd ab	17 02 00 80	12 02 00 80	00 00 00 00	04 00 00 00	01 00 00 00	09 ef 78 56	ZOOM OUT
34 12 cd ab	1A 02 00 80	15 02 00 80	00 00 00 00	04 00 00 00	01 00 00 00	09 ef 78 56	EXPOSURE AUTO
34 12 cd ab	4C 02 00 80	16 02 00 80	00 00 00 00	04 00 00 00	32 00 00 00	09 ef 78 56	EXPOSURE 50
34 12 cd ab	1C 02 00 80	17 02 00 80	00 00 00 00	04 00 00 00	01 00 00 00	09 ef 78 56	W/B AUTO
34 12 cd ab	1B 03 00 80	18 02 00 80	00 00 00 00	04 00 00 00	FF 00 00 00	09 ef 78 56	W/B BLUE 255
34 12 cd ab	1C 03 00 80	19 02 00 80	00 00 00 00	04 00 00 00	FF 00 00 00	09 ef 78 56	W/B RED 255
34 12 cd ab	1A 02 00 80	1A 02 00 80	00 00 00 00	00 00 00 00		09 ef 78 56	CAPTURE
34 12 cd ab	20 02 00 80	1B 02 00 80	00 00 00 00	04 00 00 00	01 00 00 00	09 ef 78 56	FLICKER 50Hz
34 12 cd ab	21 02 00 80	1B 02 00 80	00 00 00 00	04 00 00 00	02 00 00 00	09 ef 78 56	FLICKER 60Hz
34 12 cd ab	21 02 00 80	1D 02 00 80	00 00 00 00	04 00 00 00	00 00 00 00	09 ef 78 56	FREEZE OFF
34 12 cd ab	22 02 00 80	1D 02 00 80	00 00 00 00	04 00 00 00	01 00 00 00	09 ef 78 56	FREEZE ON
34 12 cd ab	04 03 00 80	00 03 00 80	00 00 00 00	04 00 00 00	00 00 00 00	09 ef 78 56	ROTATE 0
34 12 cd ab	05 03 00 80	00 03 00 80	00 00 00 00	04 00 00 00	01 00 00 00	09 ef 78 56	ROTATE 180
34 12 cd ab	05 03 00 80	01 03 00 80	00 00 00 00	04 00 00 00	00 00 00 00	09 ef 78 56	LAMP OFF
34 12 cd ab	06 03 00 80	01 03 00 80	00 00 00 00	04 00 00 00	01 00 00 00	09 ef 78 56	LAMP ON
34 12 cd ab	07 03 00 80	03 03 00 80	00 00 00 00	04 00 00 00	00 00 00 00	09 ef 78 56	PCPASS OFF
34 12 cd ab	08 03 00 80	03 03 00 80	00 00 00 00	04 00 00 00	01 00 00 00	09 ef 78 56	PCPASS ON

CGI Command

Enter the following URL into your web browser to view the CGI command list. To access a control command, follow the following CGI command format.

- **URL**: http://IPv4 Address/cgi-bin/NetApi?
- **Format**: http://IPv4 Address/cgi-bin/NetApi?setCmd=ParamCmd&setValue=ParamValue

Description	ParamCmd	ParamValue
Set Brightness Value	img_brightness	0 ~ 255
Set Contrast Value	img_contrast	0 ~ 255
Set Saturation Value	img_saturation	0 ~ 255
Set Effect Mode	img_effect	0, 1, 2
Set Freeze Mode	img_freeze	0, 1
Set Exposure Mode	img_exposureMode	0, 1
Set Exposure Value	img_exposure	0 ~ 99
Set White Balance Mode	img_whitebalanceMode	0, 1
Set White Balance Red	img_whitebalanceRed	0 ~ 255
Set White Balance Blue	img_whitebalanceBlue	0 ~ 255
Set Rotate Mode	img_rotate	0, 1
Set Zoom Mode	set_zoom	0, 1, 2, 3
Set Flicker Mode	set_flicker	0, 1
Set Lamp Value	set_lamp	0, 1
Set PC Pass Mode	set_pcpass	0, 1
Trigger Capture	trigger_capture	/*don't care*/
Trigger Focus	trigger_focus	/*don't care*/

RS-232 Send Command List

Send Format：0x52 + 0x0B + 0x03 + Data[0] + Data[1] + Data[2] + 0x53 + Checksum[*1]

Success Receive Format：0x53 + 0x00 + 0x02+ [*2] + 0x00 + 0x52 + Checksum [*4]

Abnormal Receive Format：0x53 + 0x00 + 0x01+ [*3] + 0x52 + Checksum [*5]

*1 ： Checksum = 0x0B xor 0x03 xor Data[0]　xor Data[1]　xor Data[2]　xor 0x53

*2 ： Receive data ok : 0x0B,　Not Command : 0x03

*3 ： ID error: 0x01, Checksum error: 0x02, Function fail = 0x04

*4 ： Checksum = 0x00 xor 0x02 xor *2　xor 0x00 xor 0x52

*5 ： Checksum = 0x00 xor 0x01 xor *3　xor 0x52

*6 ： Standby Mode Receive Data = 0x51 + 0xFF + 0x01 + 0x0B + 0x51 + 0xA4

　　　　　Power On Mode Recevice Data = No Data Return

*7 ： Standby Mode Recevice Data = 0x51 + 0x00 + 0x01 + 0x0B + 0x51 + 0x5B

　　　　Power On Mode Receive Data = 0x53 + 0x00 + 0x02 + 0x0B + 0x00 + 0x52 + 0x5B

Function	Data[0]	Data[1]	Data[2]	Checksum
POWER OFF[*6]	0x01	0x00	0x00	0x5a
POWER ON [*7]	0x01	0x01	0x00	0x5b
CAMERA MODE	0x02	0x00	0x00	0x59
PLAYBACK MODE	0x03	0x00	0x00	0x58
PC 1/2	0x04	0x00	0x00	0x5f
IMAGE CAPTURE TYPE: SINGLE	0x05	0x00	0x00	0x5e
IMAGE CAPTURE TYPE: CONTINUOUS	0x05	0x01	0x00	0x5f
CONT. CAPTURE INTERVAL +	0x06	0x00	0x00	0x5d
CONT. CAPTURE INTERVAL -	0x06	0x01	0x00	0x5c
IMAGE CAPTURE RESOLUTION: NORMAL	0x07	0x00	0x00	0x5c
IMAGE CAPTURE RESOLUTION: 13M	0x07	0x01	0x00	0x5d
TIMER START	0x08	0x00	0x00	0x53
TIMER PAUSE	0x08	0x01	0x00	0x52
TIMER STOP	0x08	0x02	0x00	0x51
TIMER SET TIME	0x08	0x03	Value[1 ~ 120]	*1
PREVIEW MODE: MOTION	0x0A	0x02	0x00	0x53
PREVIEW MODE: MICROSCOPE	0x0A	0x03	0x00	0x52
PREVIEW MODE: MACRO	0x0A	0x04	0x00	0x55

PREVIEW MODE: INFINITE	0x0A	0x05	0x00	0x54
PREVIEW MODE: NORMAL	0x0A	0x06	0x00	0x57
PREVIEW MODE: HIGH QUALITY	0x0A	0x07	0x00	0x56
PREVIEW CAPTURE	0x0B	0x00	0x00	0x50
PLAYBACK DELETE	0x0C	0x00	0x00	0x57
PLAYBACK FULL SCREEN	0x0D	0x00	0x00	0x56
MIRROR OFF	0x0E	0x00	0x00	0x55
MIRROR ON	0x0E	0x01	0x00	0x54
ROTATE OFF	0x0F	0x00	0x00	0x54
ROTATE ON	0x0F	0x02	0x00	0x56
EFFECT: COLOR	0x10	0x00	0x00	0x4b
EFFECT: B/W	0x10	0x01	0x00	0x4a
EFFECT: NEGATIVE	0x10	0x02	0x00	0x49
CONTRAST INCREASE	0x11	0x00	0x00	0x4a
CONTRAST DECREASE	0x11	0x01	0x00	0x4b
CONTRAST VALUE	0x11	0x02	Value[1 ~ 255]	*1
BRIGHTNESS INCREASE	0x12	0x00	0x00	0x49
BRIGHTNESS DECREASE	0x12	0x01	0x00	0x48
BRIGHTNESS VALUE	0x12	0x02	Value[1 ~ 255]	*1
EXPOSURE: AUTO	0x13	0x00	0x00	0x48
EXPOSURE: MANUAL	0x13	0x01	0x00	0x49
EXPOSURE MANUAL INCREASE	0x14	0x00	0x00	0x4f
EXPOSURE MANUAL DECREASE	0x14	0x01	0x00	0x4e
WHITE BALANCE: AUTO	0x15	0x00	0x00	0x4e
WHITE BALANCE: MANUAL	0x15	0x01	0x00	0x4f
WHITE BALANCE BLUE INCREASE	0x16	0x00	0x00	0x4d
WHITE BALANCE BLUE DECREASE	0x16	0x01	0x00	0x4c
WHITE BALANCE RED INCREASE	0x17	0x00	0x00	0x4c
WHITE BALANCE RED DECREASE	0x17	0x01	0x00	0x4d
FLICKER: 50Hz	0x18	0x00	0x00	0x43
FLICKER: 60Hz	0x18	0x01	0x00	0x42

RECORD: OFF	0x23	0x00	0x00	0x78
RECORD: ON	0x23	0x01	0x00	0x79
MOVIE FAST REWIND	0x25	0x00	0x00	0x7e
MOVIE FAST FORWARD	0x25	0x01	0x00	0x7f
MOVIE VOL INC	0x26	0x00	0x00	0x7d
MOVIE VOL DEC	0x26	0x01	0x00	0x7c
STORAGE: EMBEDDED	0x28	0x00	0x00	0x73
STORAGE: SD CARD	0x28	0x01	0x00	0x72
STORAGE: THUMB DRIVE	0x28	0x02	0x00	0x71
FORMAT: EMBEDDED	0x29	0x00	0x00	0x72
FORMAT: SD CARD	0x29	0x01	0x00	0x73
FORMAT: THUMB DRIVE	0x29	0x02	0x00	0x70
OUTPUT RESOLUTION: 1024x768	0x2F	0x01	0x00	0x75
OUTPUT RESOLUTION: 1280x720	0x2F	0x02	0x00	0x76
OUTPUT RESOLUTION: 1920x1080	0x2F	0x03	0x00	0x77
OUTPUT RESOLUTION: 3840x2160@30	0x2F	0x08	0x00	0x7c
OUTPUT RESOLUTION: 3840x2160@60	0x2F	0x09	0x00	0x7d
USB CONNECT: USB CAMERA	0x30	0x00	0x00	0x6b
USB CONNECT: MASS STORAGE	0x30	0x01	0x00	0x6a
BACKUP TO SD CARD	0x31	0x00	0x00	0x6a
BACKUP TO THUMBDRIVE	0x31	0x01	0x00	0x6b
PROFILE SAVE: PROFILE 1	0x32	0x00	0x00	0x69
PROFILE SAVE: PROFILE 2	0x32	0x01	0x00	0x68
PROFILE SAVE: PROFILE 3	0x32	0x02	0x00	0x6b
PROFILE RECALL: PROFILE 1	0x33	0x00	0x00	0x68
PROFILE RECALL: PROFILE 2	0x33	0x01	0x00	0x69
PROFILE RECALL: PROFILE 3	0x33	0x02	0x00	0x6a
SLIDESHOW: OFF	0x34	0x00	0x00	0x6f
SLIDESHOW: ON	0x34	0x01	0x00	0x6e
CAPTURE QUALITY: NORMAL	0x37	0x00	0x00	0x6c
CAPTURE QUALITY: HIGH	0x37	0x01	0x00	0x6d

CAPTURE QUALITY: FINEST	0x37	0x02	0x00	0x6e
AUTO FOCUS	0x40	0x00	0x00	0x1b
MENU	0x41	0x00	0x00	0x1a
ARROW - DOWN	0x42	0x00	0x00	0x19
ARROW - UP	0x42	0x01	0x00	0x18
ARROW - LEFT	0x42	0x02	0x00	0x1b
ARROW - RIGHT	0x42	0x03	0x00	0x1a
ENTER	0x43	0x00	0x00	0x18
FREEZE/STOP	0x44	0x00	0x00	0x1f
DEFAULT	0x45	0x00	0x00	0x1e
ZOOM -	0x46	0x00	0x00	0x1d
ZOOM +	0x46	0x01	0x00	0x1c
ZOOM RESET	0x47	0x00	0x00	0x1c
FOCUS TO NEAR	0x48	0x00	0x00	0x13
FOCUS TO FAR	0x48	0x01	0x00	0x12
LAMP OFF	0x49	0x00	0x00	0x12
LAMP ON	0x49	0x01	0x00	0x13
SATURATION INCREASE	0x4B	0x00	0x00	0x10
SATURATION DECREASE	0x4B	0x01	0x00	0x11
SATURATION VALUE	0x4B	0x02	Value[1 ~ 255]	*1
MUTE OFF	0x4C	0x00	0x00	0x17
MUTE ON	0x4C	0x01	0x00	0x16

RS-232 Receive Command List

Send Format：0x52 + 0x0A + 0x01 + Data[0] + 0x53 + Checksum

Receive Format：0x53 + 0x0C + 0x01 +　ReData[0] + 0x52 + ReChecksum[*1]

*1 ：ReChecksum = 0x0C xor 0x01 xor ReData[0]　xor 0x52

*2 ：Power Status Receive Data = 0x51 + 0xFF + 0x01 + 0x0A + 0x51 + 0xA5

Function	Data[0]	Checksum	ReData[0]
Red Value	0x02	0x5A	Value[0 ~ 255]
Blue Value	0x03	0x5B	Value[0 ~ 255]
Power Status	0x04	0x5C	OFF [*2]
			1: ON
Lamp Status	0x05	0x5D	0: OFF　　1: ON
Display Status	0x06	0x5E	0: Camera Mode
			1: Playback Mode
			2: PC-1 Pass Through
Freeze Status	0x08	0x50	0: OFF　　1: ON
Brightness Value	0x0A	0x52	Value[1 ~ 64]
Contrast Value	0x0B	0x53	Value[1 ~ 32]
Saturation Value	0x0D	0x55	Value[1 ~ 32]

Technical Specifications

- **Image**

Sensor	1/3.06" CMOS
Pixel Count	13 megapixels
Frame Rate	60 fps (max.)
White Balance	Auto/Manual
Exposure	Auto/Manual
Image mode	Normal, High Frame, High Quality, Microscope, Infinity, Marco
Effect	Color/B/W/Negative
RGB output	1280×720, 1024×768, 1080P
HDMI Output	4K, 1080p, 720p
Image Capture	200 Frames

- **Optics**

Focusing	Auto/Manual
Shooting Area	420 x 315mm
Zooming	Total Zoom 322x zoom (14x optical zoom + 23x digital zoom)

- **Power**

Power Source	DC 5V/3A, AC 100-240V, 50-60Hz
Consumption	10 Watts(lamp on); 9 Watts(lamp off)

- **Lightning**

Lamp Type	LED light

- **Input / Output**

HDMI Input	YES (HDMI, pass through)
HDMI Output	YES (HDMI, pass through)
VGA Input	YES (15-pins D-sub, pass through)
VGA Output	YES (15-pins D-sub, pass through)
USB-A Port	1 (Type A for USB flash drive)
USB-B Port	1 Mini-B Receptacle
MIC	Built-in
SD Card Slot	1 (micro SD card, 32GB)
Line Out	Phone Jack
Microphone	MIC in
DC 5V Input	Power Jack
Kensington Lock	YES
*RS 232(Optional)	Mini-DIN Jack (Use RS 232 Adapter Cable_optional)

- **Dimension**

Operating	481.3mm(L) x 159mm(W) x 469.9mm(H)
Folded	319.0mm(L) x 176mm(W) x 112mm(H)
Weight	2.2 +/-0.5Kg (about 5.732 lbs)

- **External Storage**

Micro SD Card	Max 32GB (FAT32)
USB Flash Drive	Max 32GB (FAT32)

please note that this specification depends on certain order.

Troubleshooting

This section provides many useful tips on how to solve common problems while using the AVerVision M90UHD.

There is no picture on the presentation screen.
1. Check all the connectors again as shown in this manual.
2. Verify the setting of the display output device.
3. If you are presenting from a notebook or computer through the display output device, check the cable connection from computer RGB (VGA) output to RGB input of AVerVision M90UHD and make sure AVerVision M90UHD is in PC Mode.
4. For HDMI display output, a delay occurs while waiting for both the display device and M90UHD to sync up. Wait for around 4 to 7 seconds until you see the camera image on the screen.

The picture on the presentation screen is distorted or the image is blurry.
1. Reset all changed settings, if any, to the original manufacturer default setting. Press **DEFAULT** on the remote or select Default in Basic tab OSD menu.
2. Use the Brightness and Contrast menu functions to reduce the distortion if applicable.
3. If you discover that the image is blurry or out of focus, press the Auto Focus button on the control panel or remote control.

There is no computer signal on presentation screen.
1. Check all the cable connections among the display device, AVerVision M90UHD and your PC.
2. Connect your PC to the AVerVision M90UHD first before you power on your computer.
3. For notebook, repeatedly press FN+F5 to toggles between display modes and display the computer image on the presentation screen. For different command, please refer to your laptop manual.

The presentation screen does not show the exact desktop image on my PC or Notebook after I toggle from Camera to PC mode.
1. Return to your PC or Notebook, place the mouse on the desktop and right click, choose "Properties", choose "Setting" tab, click on "2" monitor and check the box "Extend my Windows desktop onto this monitor".
2. Then go back one more time to your PC or Notebook and place the mouse on the desktop and right click again.
3. This time choose "Graphics Options", then "Output To", then "Intel® Dual Display Clone", and then choose "Monitor + Notebook".
4. After you follow these steps, you should be able to see the same desktop image on your PC or Notebook as well as on the presentation screen.

AVerVision M90UHD can't detect the inserted USB flash drive.
Make sure the USB flash drive is properly inserted and in correct format. Only FAT32 is supported.

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