

USB2.0 CMOS CAMERA SMALL TYPE

ARTCAM-0134AR-UVC Series

INSTRUCTION BOOKLET

1.2M pixels ARTCAM-0134ARSS-UVC Series

1.2M pixels ARTCAM-0134ARMINI-UVC Series

ARTRAY CO., LTD.

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1. Attention

■About this manual

1. Before using the camera, please read this manual thoroughly.
2. Please keep this manual reachable and always refer to the contents when needed.
3. Please contact us if the manual is lost or damaged. We will provide a replacement.
4. We cannot guarantee the safety of improper uses of the camera.
5. For your safety, please follow the directions of this manual.
6. All contents are subject to change.
7. Images in this manual may have been simplified to be easier comprehended.
8. Please contact us if you find any unclear points or mistakes in this manual.
9. Quoting, copying or altering some or all parts of the manual without our permission is prohibited.
10. We are not responsible for any lost or damages on your profits due to the use of our products.
11. Please understand that our oversea branches do not provide maintenance or repair services.

■About the Icons

To keep the safety of the user, other people and their properties, please pay attention to the following icons.



Warning

If the user fails to follow the instruction, serious injury or death may occur.



Caution

If the user fails to follow the instruction, physical injury on human or damages on hardware may occur.

■ For Safe Use



Warning

● In following circumstances, please stop using the product and turn off the power immediately to prevent the risks of fires and electric shocks. If the product is defective, please contact us for repair or exchange. For your safety, please do not disassemble, modify or repair the camera on your own.

Please stop using the product and turn off the power immediately when:

- The product becomes smoky or gets extremely hot on the surface, or makes unusual smells or sounds.
- Foreign material or water gets into the product.
- The product falls and becomes damaged.

● Do not place the product on unstable surfaces. The product may be fallen and people may get hurt.



Caution

● Do not expose the product to steam or fumes to avoid electric shocks and fires.

● Do not leave the product in high temperature places such as inside of vehicles or under direct sunlight. High temperature may cause damages to the camera, or even cause fires.

● Do not cover the product with cloth or other materials. The product may get extremely hot and the heat may cause deformations on the parts or even cause fires.

● Please avoid dropping or shocking the product as the product may be damaged.

● Do not touch the cable with a wet hand. Such action may cause electric shocks.

● Please avoid continuously contacting the surface of the camera to your skin when the camera is being used. The surface temperature of the camera may cause burns.

■ Other Notices

● Please do not use the camera under strong lights such as sun light for a long period. Also please do not expose the camera under strong lights even when the product is not being used because the sensor might be damaged.

■ Maintenance

● Wipe the dirt on surface with soft cloth or tissue paper. Do not use alcohol, thinner or benzene to avoid damaging the surface paints.

■ Electro Magnetic Interference

● The camera may interfere with electronic devices such as TV and radio. Please do not place the camera next to such equipment.

■ Export Control

This product is a Catch-all Control item subject to the Foreign Exchange and Foreign Trade Act and its relevant legislations. Except for exporting to the 26 white countries designated in the Cabinet Order, export licenses are required if the products are going to be used for military use or if the end user of the product is related to all kinds of military activities. If your circumstances cause the need to apply export licenses, please notify us before you place orders. Also, please notify us in advance if the end users or purposes of use change after the purchase and thus cause the need to apply export licenses.

About the Japanese Security Export Controls, please refer to the webpage for Security Export Control Policy, the Ministry of Economy, Trade and Industry:

www.meti.go.jp/policy/anpo/englishpage.html

The above is based on the enforcement laws and regulations at the time of issuance of this document. Please be sure to check the latest laws and regulations before actually exporting this product.

■ Guarantee

To save the environment, we do not issue warranty in printed format. Instead, all records of the warranty periods, delivery dates and the customer information are well kept in our system.

For more details, please refer to the following link:

Hardware Warranty: http://www.artray.us/download/artray_warranty.pdf

● We do not guarantee the functions of this product or the descriptions on this manual to be completely adapted to the users' end applications or marketing purposes. We are also not held responsible for any direct or indirect damages caused by our products under any circumstances.

● Please do not use this product for a task that requires high reliability. This product is not manufactured to be used as medical, nuclear, aerospace, transportation equipment or equipment or that is highly related to human safety. We are not held responsible for any damages on the users' property, equipment or personal safety caused by this product.

■ Disposal

● To dispose this product, please return the camera to us. If you decide to dispose the camera without returning it to us, please follow related regulations and have the camera disposed as an industrial waste. Please always keep track of the disposal, and make sure the disposed camera cannot be accessed or used by any third party.

2. Introduction

ARTCAM-0134AR-WOM Series is CMOS cameras for industrial use.

This series adopt USB2.0 interface, so the data can be delivered to PC directly without a capture board.

With UVC support, it can be used on various platforms without being aware of drivers.

3. Main Features

- USB2.0 Interface

Our cameras adopt USB2.0 interface, so the data can be delivered to PC directly and no capture board is needed.

- UVC (USB Video Class) compatible

Since it is compatible with UVC, you can use it immediately without installing a driver just by connecting the USB cable to a PC or the like.

- Supports global shutter

Since the shutter method of the adopted CMOS sensor is the global shutter method, Even when shooting a fast-moving subject, you can shoot clear images without blurring.

- Small and Light

Our cameras are small and light, thus can be easily installed according to your desires.

Also, the board type camera with small type board lens is easy to be incorporated with other machines.

4. The Product

- 1) Camera
- 2) USB2.0 cable (TYPE A – dedicated connector 1.8m)
- 3) Software CD

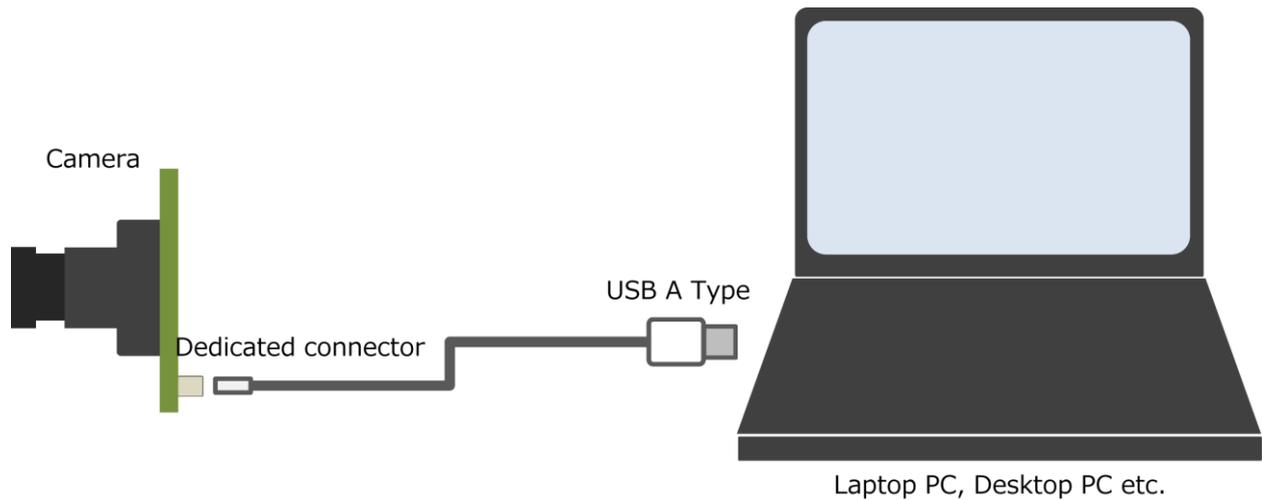
<Options>

5m extension cable with USB2.0 repeater

5. Connections

5.1. How to connect a camera

When used with general notebook PCs, desktop PCs, etc. Connect the camera and PC with the included USB2.0 cable (TYPE A – dedicated connector).

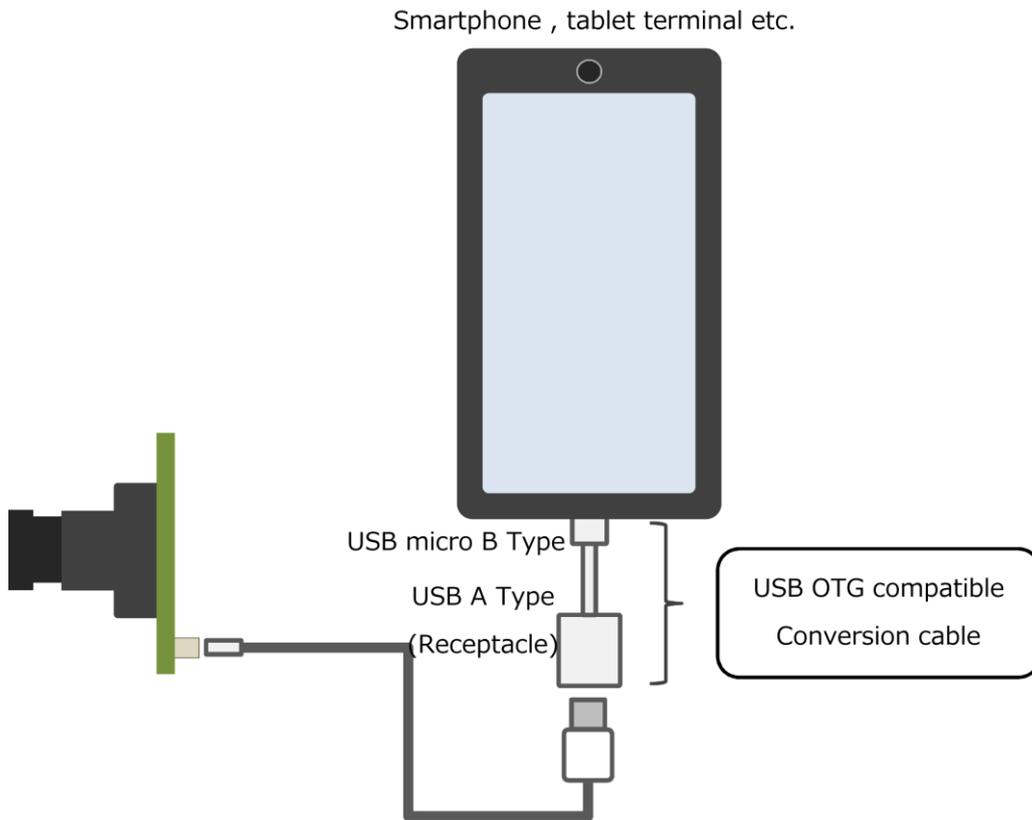


When used on smartphones, tablets, etc.,

Connect a commercially available USB OTG compatible conversion cable, etc. to a smartphone, etc., and connect the USB A Type receptacle terminal to the included USB 2.0 cable.

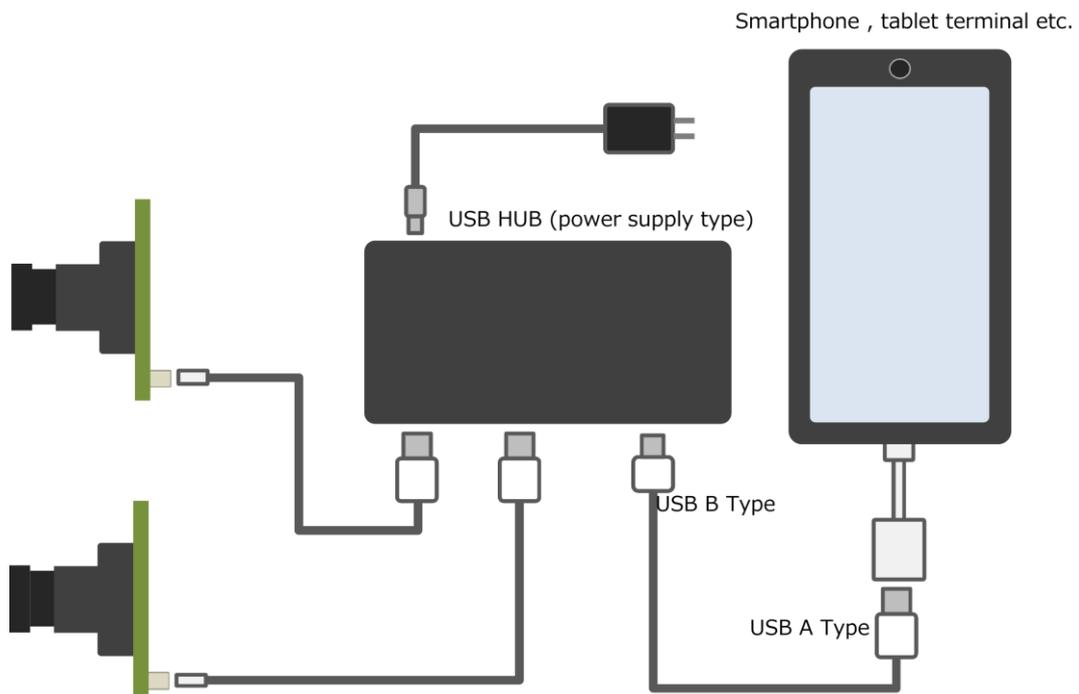
At this time, the power of the camera is supplied from the smartphone terminal.

*Depending on the terminal, some may not be compatible, so be sure to check before purchasing the camera.



When connecting multiple cameras, connect a USB hub with a USB OTG compatible cable and a USB A-B cable, then connect the USB hub and camera with the included USB 2.0 cable.

*In this configuration, when charging the smartphone side, the HUB and smartphone must support the ACA-Dock standard.



6. Specifications

6.1. Color Model

	ARTCAM-0134ARSS-UVC ARTCAM-0134ARSS-UVC-OP ARTCAM-0134ARSS-UVC-OP-CM	ARTCAM-0134ARMINI-UVC-OP
Sensor Type	CMOS Color Image Sensor	
Active Pixels	1280(H) × 960(V)	
Active Imager Size	4.86(H) × 3.66(V)mm(Effective 4.80mm x 3.60mm) 1/3"	
Scan Mode	Progressive Scan	
Pixel Size	3.75(H) × 3.75(V) μm	
Shutter Type	Global Shutter	
Color Filter Array	RGB Bayer Pattern	
Frame Rate	YUV : 7.5fps (1280 x 960)、YUV : 10.0fps (1280 x 720) YUV : 30.0fps (640 x 480)、MJPEG : 30.0fps (1280 x 960) MJPEG : 60.0fps (1280 x 720)、MJPEG : 54.0fps (640 x 480)	
Shutter Speed	1/8192 ~ 1/2s	
Interface	USB2.0 Isochronous transfer (USB Video Class 1.1 compliant)	
Synchronization System	Internal Synchronization	
Lens Mount	C Mount (0134ARSS-UVC/0134ARSS-UVC-OP-CM) Board lens Mount M12 P0.5 (0134ARSS-UVC-OP)	Board lens Mount M12 P0.5
Power	DC5V(Supplied by USB port)	
Power Consumption	Under Approx.1W	
Ambient Conditions	Operating Temperature/Humidity : 0~35° C/10~80%(Non condensing) Storage Temperature/Humidity : 0~60° C /10~95%(Non condensing)	
External Dimensions	33.8(W) × 33.8(H) × 50.5(D)mm (0134ARSS-UVC) 28.0(W) × 28.0(H) × 1.6(D)mm (0134ARSS-UVC-OP) 38.0(W) × 38.0(H) × 20.6(D)mm (0134ARSS-UVC-OP-CM) *Lens,tripod mount and cable not included	40.0(W) × 15.0(H) × 1.6(D)mm *Lens not included
Weight	Approx.60g (0134ARSS-UVC) Approx.5g (0134ARSS-UVC-OP) Approx.30g (0134ARSS-UVC-OP-CM) *Lens,tripod mount and cable not included	Approx.3g *Lens not included

6.2. Monochrome Model

	ARTCAM-0134ARSS-BW-UVC ARTCAM-0134ARSS-BW-UVC-OP ARTCAM-0134ARSS-BW-UVC-OP-CM	ARTCAM-0134ARMINI-BW-UVC-OP
Sensor Type	CMOS Monochrome Image Sensor	
Active Pixels	1280(H) × 960(V)	
Active Imager Size	4.86(H) × 3.66(V)mm(Effective 4.80mm x 3.60mm) 1/3"	
Scan Mode	Progressive Scan	
Pixel Size	3.75(H) × 3.75(V) μ m	
Shutter Type	Global Shutter	
Frame Rate	YUV : 7.5fps (1280 x 960)、YUV : 10.0fps (1280 x 720) YUV : 30.0fps (640 x 480)、MJPEG : 30.0fps (1280 x 960) MJPEG : 60.0fps (1280 x 720)、MJPEG : 54.0fps (640 x 480)	
Shutter Speed	1/8192 ~ 1/2s	
Interface	USB2.0 Isochronous transfer (USB Video Class 1.1 compliant)	
Synchronization System	Internal Synchronization	
Lens Mount	C Mount (0134ARSS-BW -UVC/0134ARSS-BW -UVC -OP-CM) Board lens Mount M12 P0.5 (0134ARSS-BW-UVC-OP)	Board lens Mount M12 P0.5
Power	DC5V(Supplied by USB port)	
Power Consumption	Under Approx.1W	
Ambient Conditions	Operating Temperature/Humidity : 0~35° C/10~80%(Non condensing) Storage Temperature/Humidity : 0~60° C /10~95%(Non condensing)	
External Dimensions	33.8(W) × 33.8(H) × 50.5(D)mm (0134ARSS-BW-UVC) 28.0(W) × 28.0(H) × 1.6(D)mm (0134ARSS-BW-UVC-OP) 38.0(W) × 38.0(H) × 20.6(D)mm (0134ARSS-BW-UVC-OP-CM) *Lens, tripod mount and cable not included	40.0(W) × 15.0(H) × 1.6(D)mm *Lens not included
Weight	Approx.60g (0134ARSS-BW-UVC) Approx.5g (0134ARSS-BW-UVC-OP) Approx.30g (0134ARSS-BW-UVC-OP-CM) *Lens, tripod mount and cable not included	Approx.3g *Lens not included

6.3. Camera function

No	item	Setting range	default value	remarks
1	Brightness	-64~64	0	adjust the brightness
2	contrast	0~255	128	adjust the contrast
3	Vividness	0~255	76	adjust the saturation *1
4	sharpness	0~4	1	Adjust sharpness correction
5	gamma	48~144 (4 step)	100	Adjust gamma value $\gamma = \text{set value} / 100$, when set to 100 $\gamma = 1.00$
6	White balance	2800~6500 (100 step)	5100 (daylight white)	Set the white balance by color temperature *2
7	auto white balance	ON/OFF	OFF	Automatic white balance adjustment
8	gain	32~255	32	Sets the sensor gain Gain is set value x 0.03125
9	Exposure (exposure time)	-13~-1 1~5001 *3	-7 80 *3	Sets the sensor exposure time
10	Automatic exposure adjustment	ON/OFF	OFF	Adjust exposure time automatically Default target luminance value is 84 in 8bit value
11	Low light correction	ON/OFF	OFF	It is an ON/OFF switching function for external IO, and it is possible to turn ON/OFF LEDs, etc. (option)

*1 Saturation sets the gain value for Cb and Cr of the YCbCr signal. The gain is set value x 0.03125, $32 \times 0.03125 = 1.00$ [times] when the setting value is 32, and $76 \times 0.03125 = 2.375$ times when the setting value is 76 (default).

*2 White balance is adjusted with our default optical system, and may not be fully adjusted depending on the combination of lenses and filters. In that case, customization is also possible, so please contact us individually. Also, when the auto white balance is turned on, the white balance is constantly adjusted in response to changes in the screen, but it is not possible with normal software to fix the settings adjusted by the auto white balance.

In this case, software customization is required, so please contact us individually.

*3 Exposure time is set to "2 to the power of the set value [seconds]" when set in the Windows standard properties. For example, a setting of -7 (the default) gives an exposure time of $2^{(-7)} = 1/128$ seconds (approximately 7.81 milliseconds).

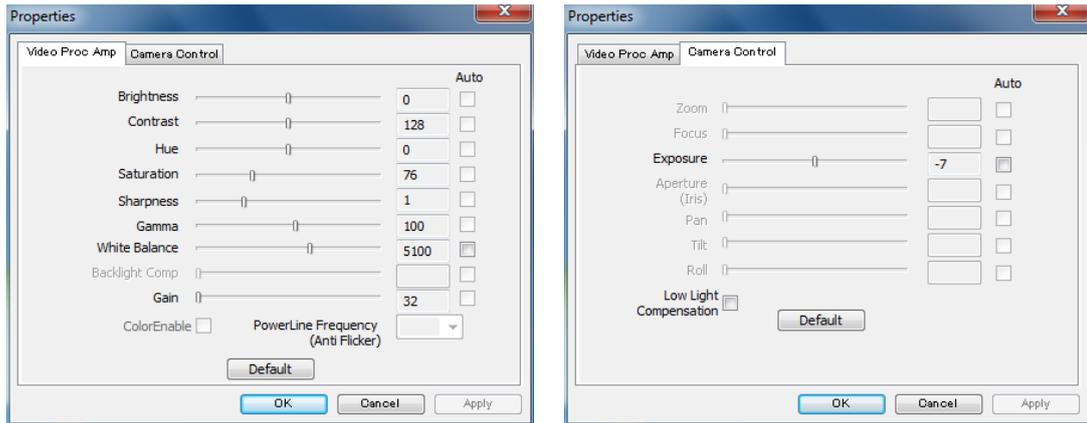
Otherwise, it will be set in units of approximately 100 microseconds.

For example, if the setting value is 80 (default value), the exposure time will be $80 * 100 = 8000$ [μ sec] (about 8 milliseconds)

If the exposure time exceeds the default 1 frame time, the frame rate will be reduced.

*4 For monochrome type, brightness, contrast, vividness, sharpness, gamma, and white balance settings are ignored. Only the settings of exposure time, gain, and low light compensation (external IO) are valid. In addition, if you have any questions about settings or individual customization, please contact us.

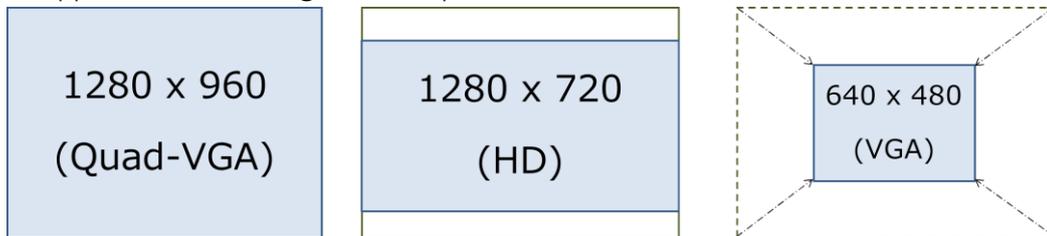
Standard property screen for Windows 7 and later



*Depending on the PC environment, a unique property screen may be displayed.

6.4. Output resolution setting

The camera supports the following three output resolutions.



*For 640x480 (VGA) output, the entire screen is reduced by the binning function.

6.5. Output format

The camera supports two output formats, YUV422/MJPEG, and can be switched by software.

*For monochrome cameras, the upper 8-bit data is output only to the Y signal of YUV422.

When displaying in RGB space, RGB output values may differ due to YUV-RGB conversion.

6.6. Frame rate setting

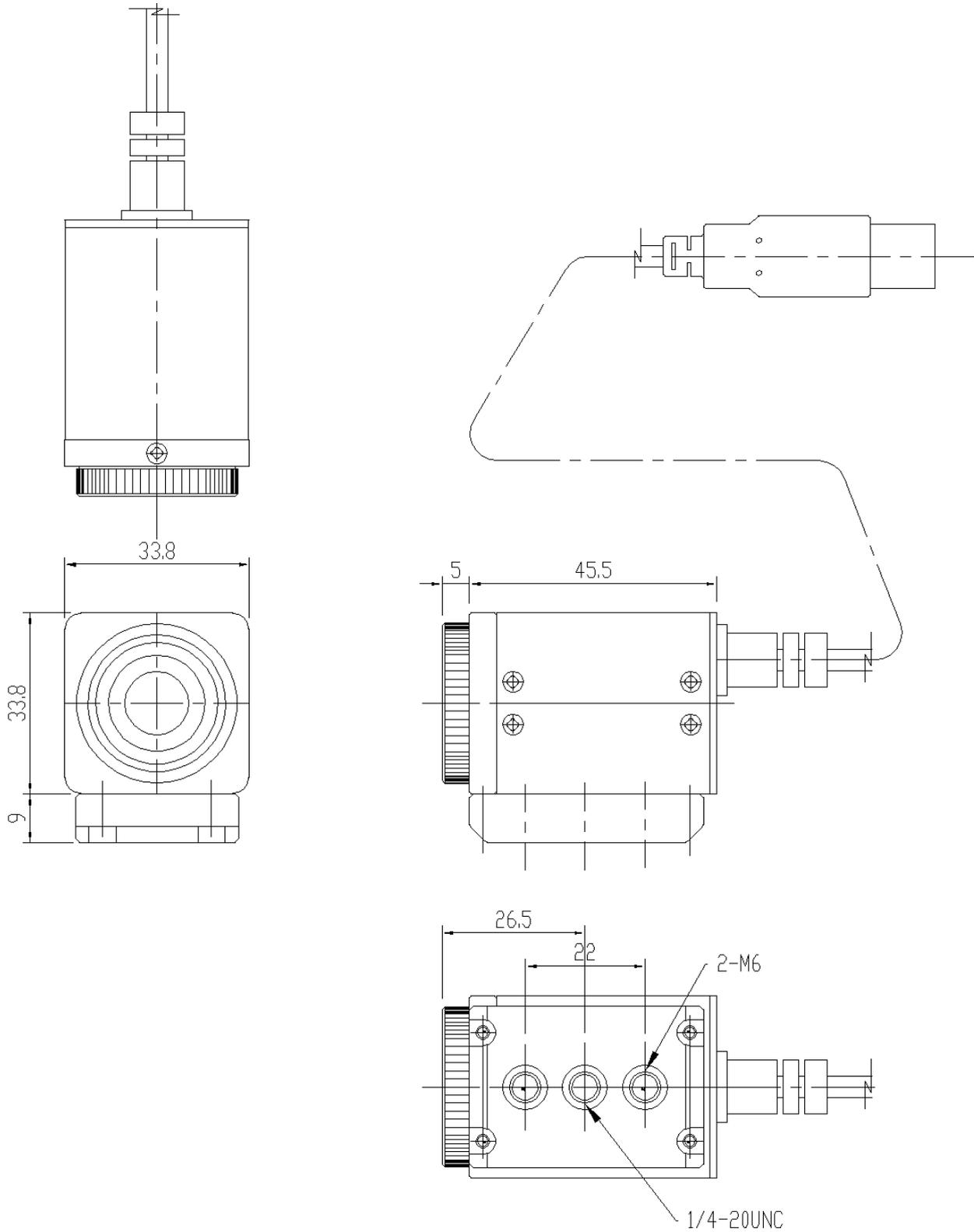
The camera has configurable frame rates for each output resolution.

The frame rates that can be set are shown in the table below. (default value is in red)

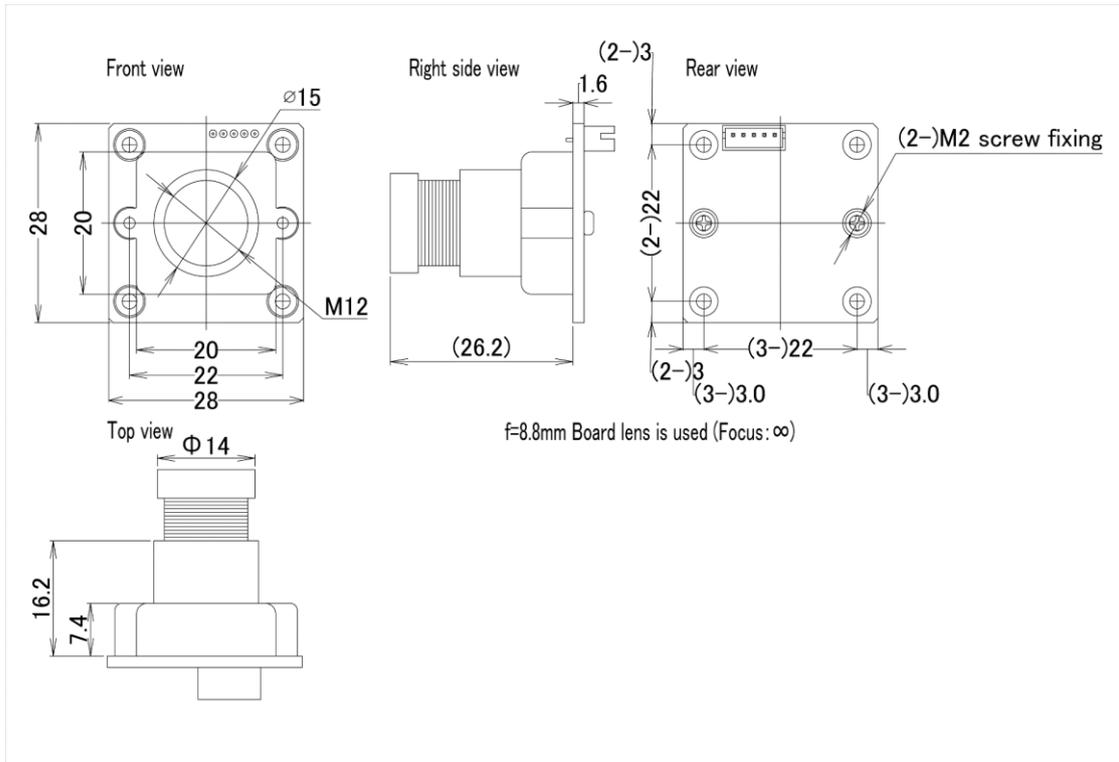
Resolution	Format	Frame rate
1280x960	MJPEG	30.0fps / 15.0fps
1280x720	MJPEG	60.0fps / 30.0fps / 15.0fps
640x480	MJPEG	54.0fps / 30.0fps
1280x960	YUV	7.5fps / 4.0fps
1280x720	YUV	10.0fps / 5.0fps
640x480	YUV	30.0fps / 15.0fps

7. Dimensions

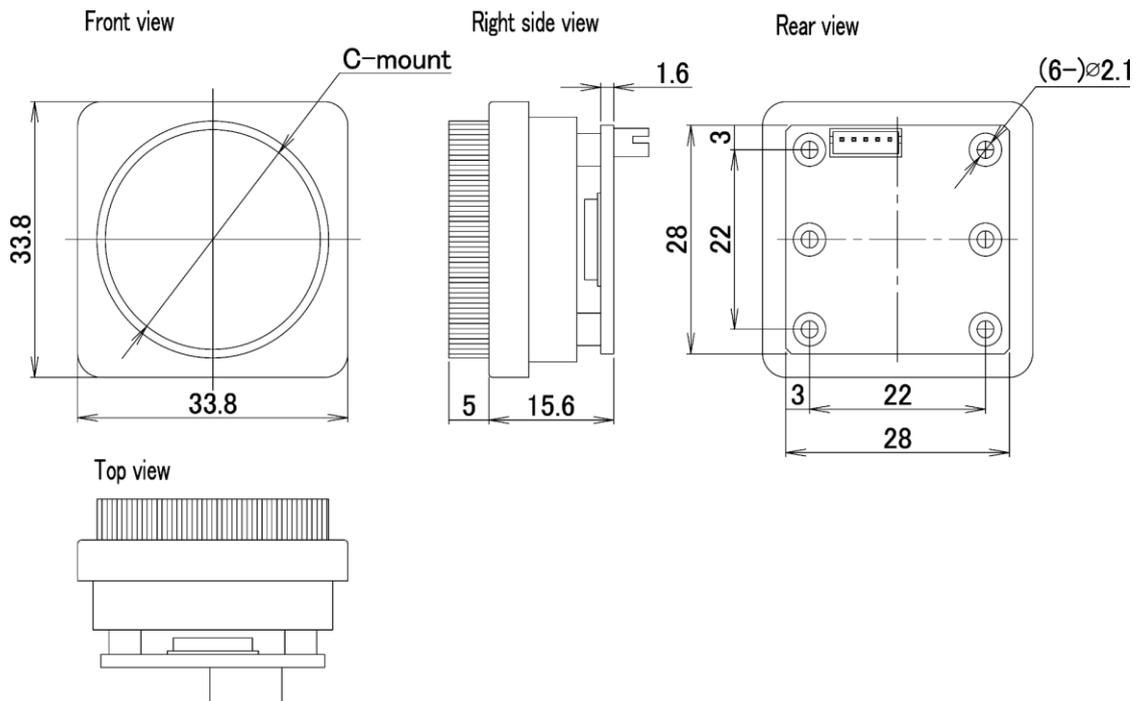
7.1. ARTCAM-0134ARSS-UVC/0134ARSS-BW-UVC



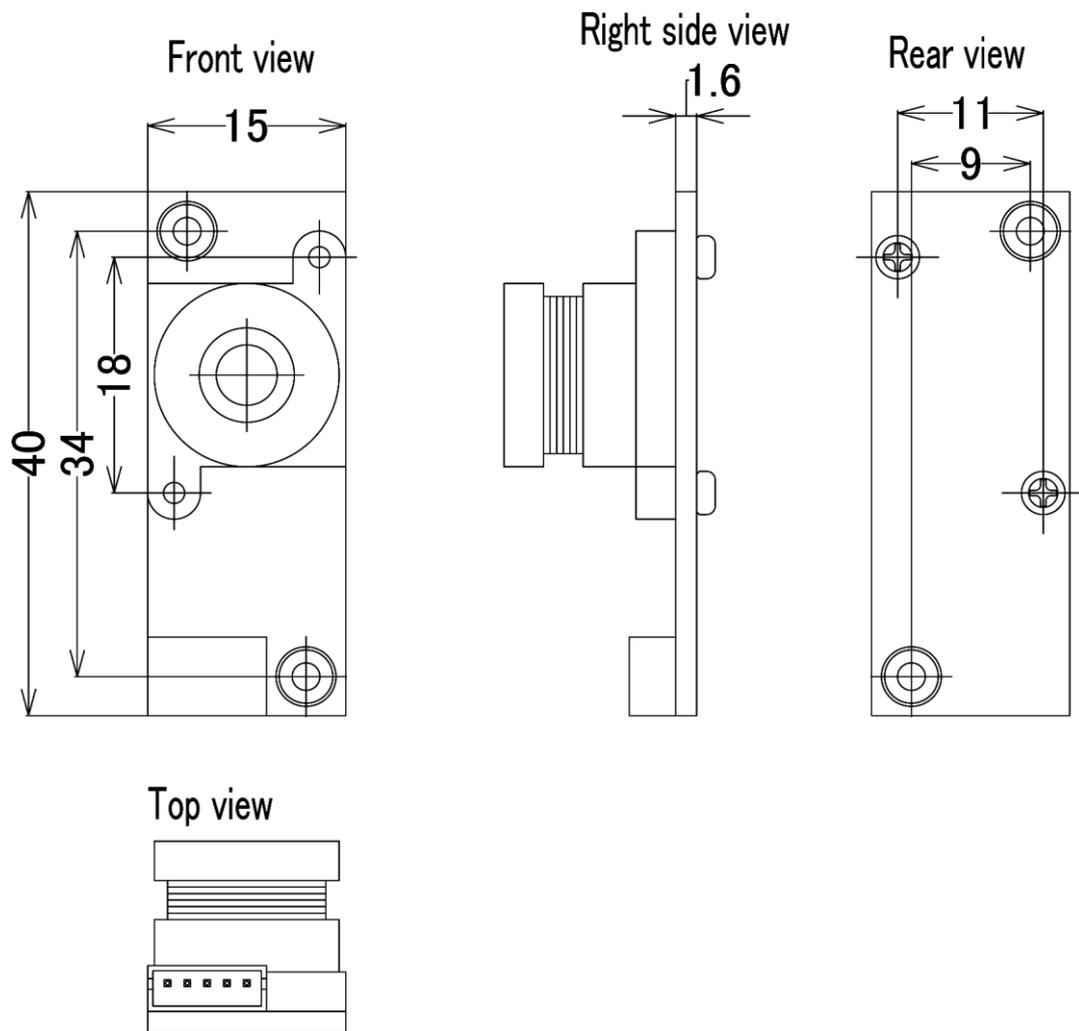
7.2. ARTCAM-0134ARSS-UVC-OP/0134ARSS-BW-UVC-OP



7.3. ARTCAM-0134ARSS-UVC-OP-CM/0134ARSS-BW-UVC-OP-CM

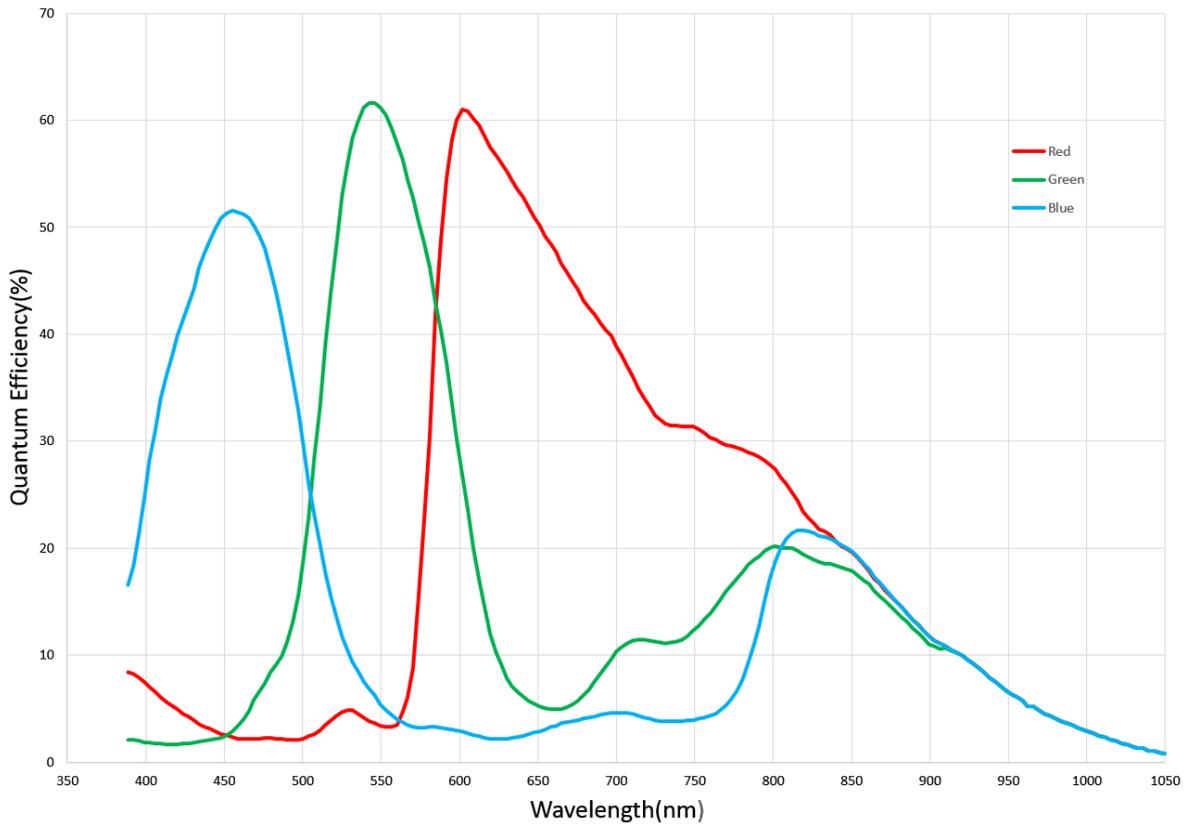


7.4. ARTCAM-0134ARMINI-UVC/0134ARMINI-BW-UVC

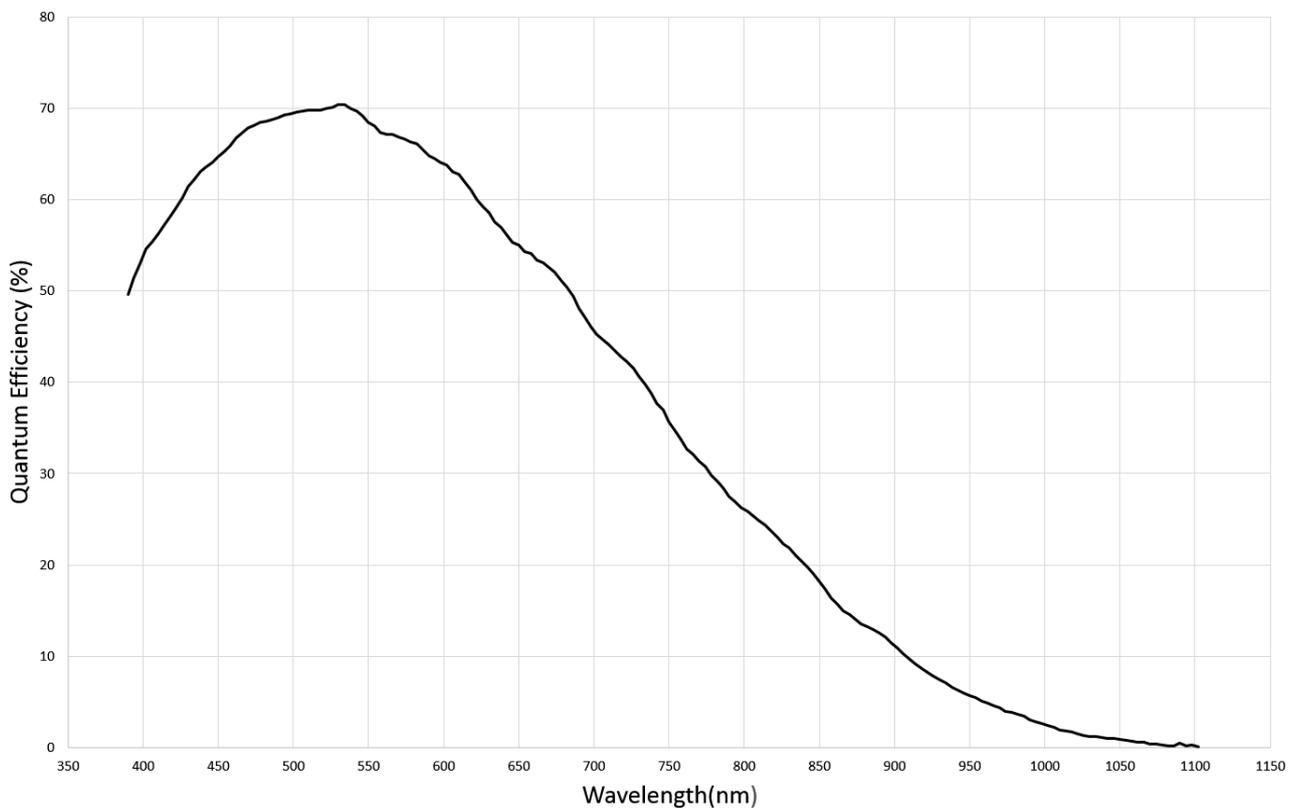


8. Spectral Sensitivity Characteristics

8.1. ARTCAM-0134ARSS-UVC/0134ARMINI-UVC (Color model)



8.2. ARTCAM-0134ARSS-BW-UVC/0134ARMINI-BW-UVC (Monochrome Model)



9. System Requirements

9.1. Recommended System Requirements

- Host Controller

This camera is applicable to USB 2.0.

- CPU

The driver of this camera is applicable to computer architecture "x86" or "amd64".

The specification of CPU effects directly the imaging process speed, therefore it is highly recommended to utilize a high-end CPU if possible.

- Memory

In the viewer software, there is a data buffer which can store 4 to 8 frames.

Therefore, it is necessary to keep spare space at least for 8 frames in the memory.

(For example, when using 1.3MP color camera, $1280 \times 1024 \times 3 \times 8$ [byte] = 30[MB] is necessary.)

It is highly recommended to keep enough memory space especially when using high resolution camera.

- OS

This camera is applicable only to the architecture of Windows NT (32bit/64bit).

Standard functions are confirmed with OS after Windows 7.

In addition, it is recommended to use Windows 10.

(Other platforms that support UVC, such as Linux and Android, can be used.)

*Please refer to "Supported Platforms" below.



Caution

■ Please refer the restrictions below when you use ARTCAM series.

(1) Recommended System Requirements

If the system specifications do not meet the requirements recommended above, it may be difficult to run at the maximum frame rate.

(2) Supported platforms (operation confirmed)

Windows 7 32/64bit

Windows 10 32/64bit

Ubuntu Linux 14.04 32/64bit

Android OS (v6.0.1)

We have confirmed that it works on the above platforms,

Operation is not guaranteed on all devices and in all environments.

Also, even if it does not work due to lack of transfer bandwidth, it may work by lowering the frame rate of this product, so please try it.

We can also customize the frame rate, so please feel free to contact us.

(3) Connection of Multiple USB Devices

When connecting multiple USB devices to one USB host controller, some USB device may fail to function stably depending on the specifications of the host controller.

(Problem of power supply, data transfer bandwidth, etc.)

To avoid power supply problem, it is recommended to use powered USB hub.

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