USB2.0 CMOS CAMERA

ARTCAM-1000MINI

INSTRUCTION BOOKLET

10.0M pixels   ARTCAM-1000MINI

ARTRAY

ARTRAY CO., LTD.

Contents

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 interference with electronic devices such as TV and radio. Please do not place the camera next to such equipment.

■Export Control

The Government of Japan controls military sensitive goods and technologies including relevant dual-use goods and technologies.

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.

*The 26 white countries not under the UNSC Arms Embargo:
Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxemburg, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States

About the Japanese Security Export Controls, please refer to the webpage for Security Export Control Policy, The Ministry of Economy, Trade and Industry:
http://www.meti.go.jp/policy/anpo/englishpage.html

■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 sites below:

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

2. Introduction

ARTCAM-1000MINI is a CMOS camera for industrial use.
This camera adopts USB2.0 interface, so the data can be delivered to a PC directly without a capture board.
The mini size 20 x 25 x 25mm and light weight, it is suitable for the device integration.
The open frame model of the structure that a sensor board and a USB board separated, it is suitable for various apparatus.

3. Main Features

●High Resolution
With high resolution of 10 mega pixels

●USB2.0 Interface
Our cameras adopt USB2.0 interface, so the data can be delivered to PC directly and no capture board is needed.
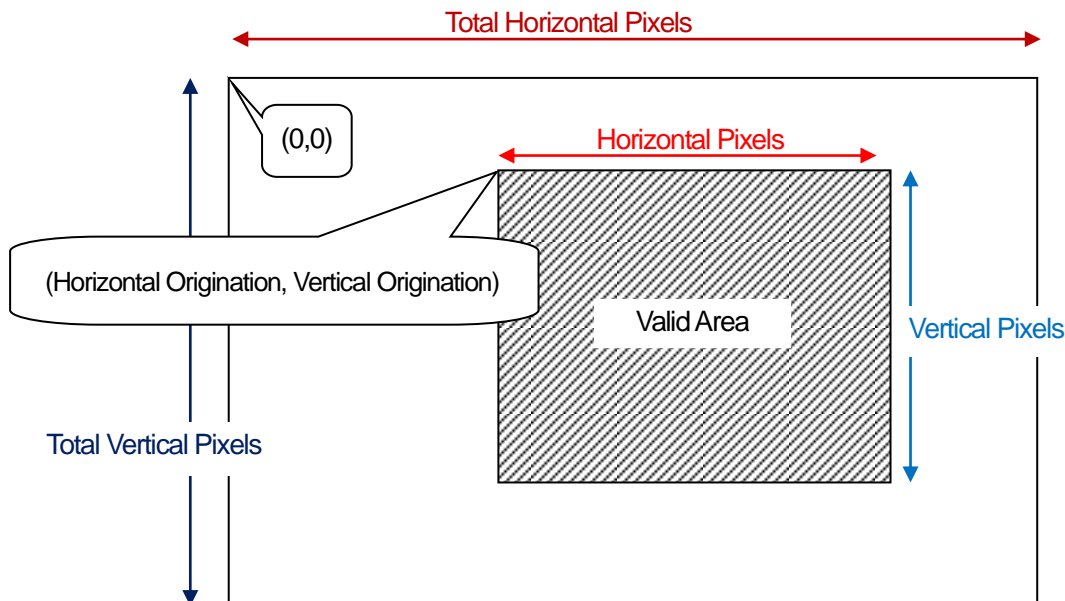
●Small and Light
Our cameras are small and light, thus can be easily installed according to your desires.
The board type camera with small type board lens is easy to be incorporated with other machines.

●ROI (Region Of Interest)
One major benefit of CMOS sensor is the ROI function which enables readout of designated partial images with a faster transmission speed.

●Mirror function
You can flip images vertically and horizontally by process of a sensor.

●Bounded Viewer Software
We provide the Viewer Software - ART-Viewer (Windows 7/8/10).
With this software, users can easily preview, save images and change camera settings.

●Direct Show compatible
Except for being recognized as a standard USB device on the PC, some of the cameras may also be recognized as a DirectShow device.
(Please check if the model is DirectShow compatible with the sales representative before purchase)

●2D Measurement & Filing Software(Optional)
Useful 2D measuring functions are available with the optional 2D Measuring & Filing Software - ART-MEASURE.

●Software Development Kit(Optional)
For customer who prefers to create their own image processing software or use our camera with other applications, we provide SDK upon requests.
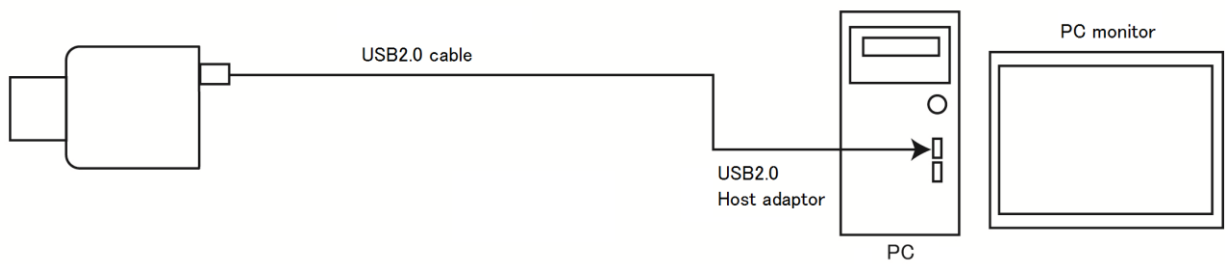
4. The Product

1) Camera

2) Board Lens f8.8mm

3) USB Cable: one end of the cable integrated to the camera, 0.9m approx.

4) Instruction Booklet

5) Viewer Software / Device Driver CD

<Options>

1) Board Lens (M12 P0.5)

2) 2D Measurement & Filing Software　[ART-MEASURE]

3) Software Development Kit　[ARTCCM-SDK]

4) 5m Extension Cable with USB2.0 Repeater

5. Connect the Camera

5-1　How to Connect a Camera

5-2　Shutter Speed

Shutter speed can be changed on the standard viewer software ART-Viewer.
The shutter speed is set directly on the sensor register, so please refer to the following formulas for the real exposure time.

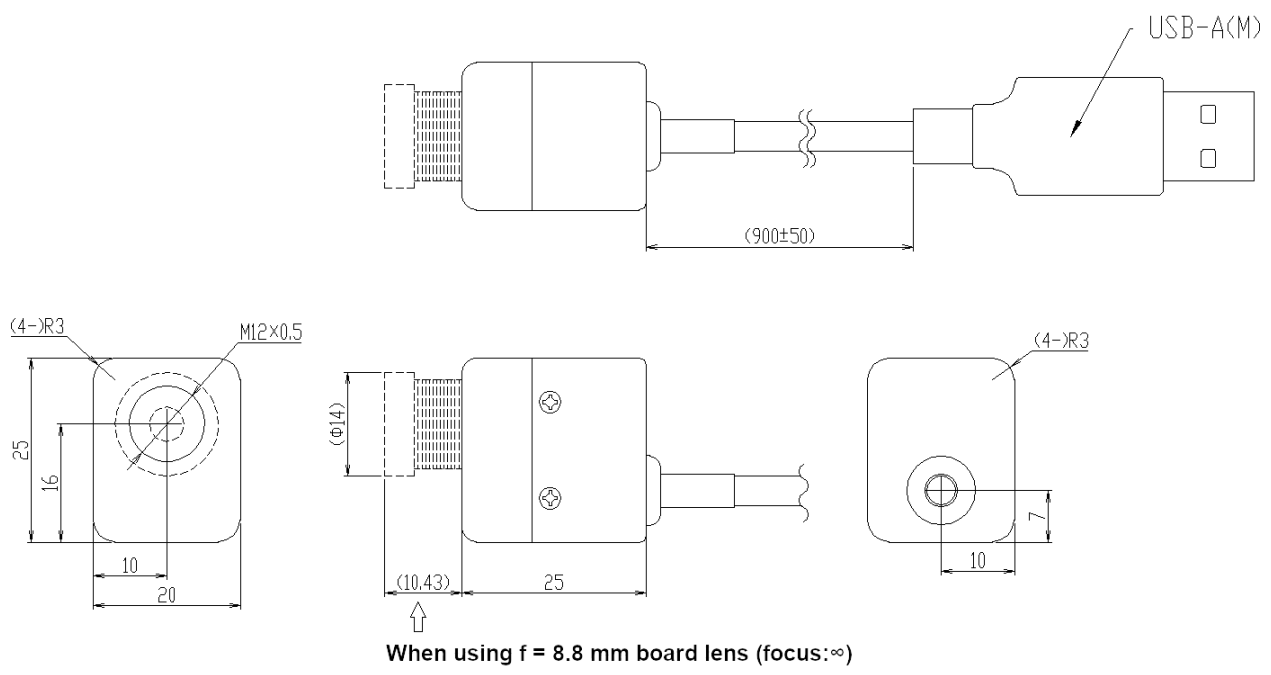| Model	Method
ARTCAM-1000MINI	Range : 1～8191(Exposure Time : 1/3507～1.348sec) Exposure Time= (Shutter Valuex3952+2891)x0.0417　[μsec] *3840x2748 pixels at 24MHz

5-3　Operation Clock Settings

Users can switch the operation clock between 24MHz / 12MHz with the standard viewer software or SDK.
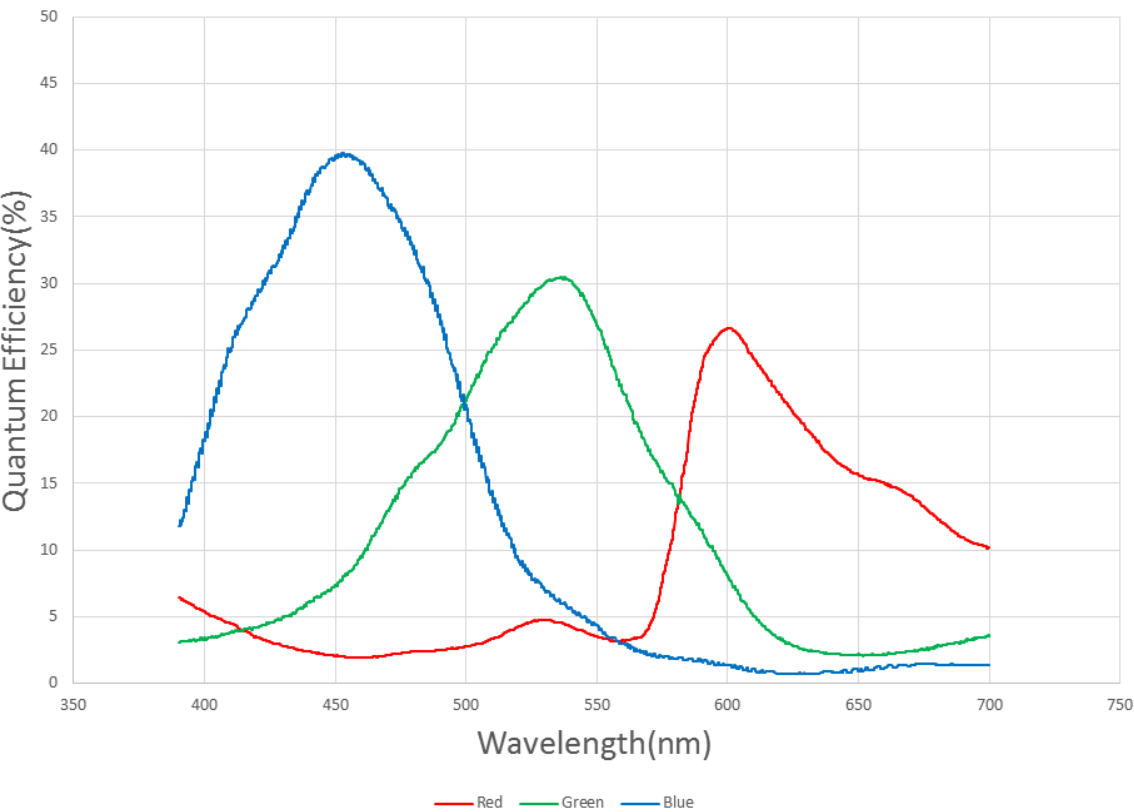
6. Specifications

MODEL	ARTCAM-1000MINI
Sensor Type	CMOS Color Image Sensor
Active Pixels	3856(H)×2764(V)
Active Imager Size	6.41(H)×4.59(V)mm, 1/2.3"
Scan Mode	Progressive Scan
Pixel Size	1.67(H)×1.67(V)μm
Shutter Type	Rolling Shutter
Color Filter Array	RGB Bayer Pattern
Frame Rate	2.2fps
Shutter Speed	1/3052~1.348
Interface	USB2.0 Bulk Transfer
Synchronization System	Internal Synchronization
Lens Mount	Board Lens Mount M12 P0.5
Power	DC5V (Supplied by USB port)
Power Consumption	Under Approx.2W
Ambient Conditions	Operating Temperature/Humidity : -10~50℃ /10~95%(Non condensing)
External Dimensions	20(W)×25(H)×25(D)mm *Lens, tripod mount not included
Weight	50g *Lens,tripod mount and cable not included

7. External Dimensions

USB-A(M)

(900±50)

(4-)R3   M12×0.5   (Φ14)   (4-)R3

25   16   10   20

(10,43)   25

When using f = 8.8 mm board lens (focus:∞)

7   10

8. Spectral Sensitivity Characteristics

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 x 1024 x 3 x 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.

⚠ 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) 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.

(3) USB2.0 Cable Extension

We cannot guarantee the functionality of the USB2.0 camera if the user adopts USB2.0 extension cables or repeaters which are not confirmed by us. With the extension cables or repeaters, the bandwidth of transfer may differ, and thus caused malfunctions such as a low frame rate or recognition failure on the camera.

What may cause the problem is that the regulation of the power lines becomes not enough, and so causes impudence mismatch on data signals.

*For the recommended extension cable, please contact our sales department.

(TEL: +81-3389-5488)