

USB2.0 CCD CAMERA

ARTCAM Series(CCD)

INSTRUCTION BOOKLET

1.25M pixels	ARTCAM-445KY2 Series
1.25M pixels	ARTCAM-445SS Series
1.5 M pixels	ARTCAM-150PⅢSeries
1.5 M pixels	ARTCAM-267KY Series
2.0 M pixels	ARTCAM-274KY Series
5.0 M pixels	ARTCAM-500P II Series
5.0 M pixels	ARTCAM-625KY Series

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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 an 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, physical injury on human or damages on hardware may occur.



Caution

If the user fails to follow the instruction, serious injury or death 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 27 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 27 white countries not under the UNSC Arms Embargo :

Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Republic of Korea, 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](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](http://www.artray.us/download/artray_warranty.pdf)

2. Introduction

ARTCAM CCD Series is CCD cameras for industrial use.

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

We provide a variety including cased cameras, board cameras which can be easily incorporated to other equipment, and so on.

3. Main Features

- High Resolution, High Frame Rate

We provide high speed CCD cameras of a wide range of resolutions from 1.25 mega pixels to 5 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.

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

- Varieties to Your Needs

We provide a variety including cased cameras, board type cameras, C-Mount board type cameras.

Also, we provide color and monochrome models to meet customers' needs.

(ARTCAM-500P II has only color model available)

- External Trigger

ARTCAM-445KY2 / 150P III / 267KY / 274KY / 500P II / 625KY series are designed with external triggers.

- Bounded Viewer Software

We provide the Viewer Software - ART-Viewer (Windows XP/Vista/7).

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.

- Recording Software(Optional)

The optional recording software - ART-REC allows the user to save movies in AVI format.

- 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

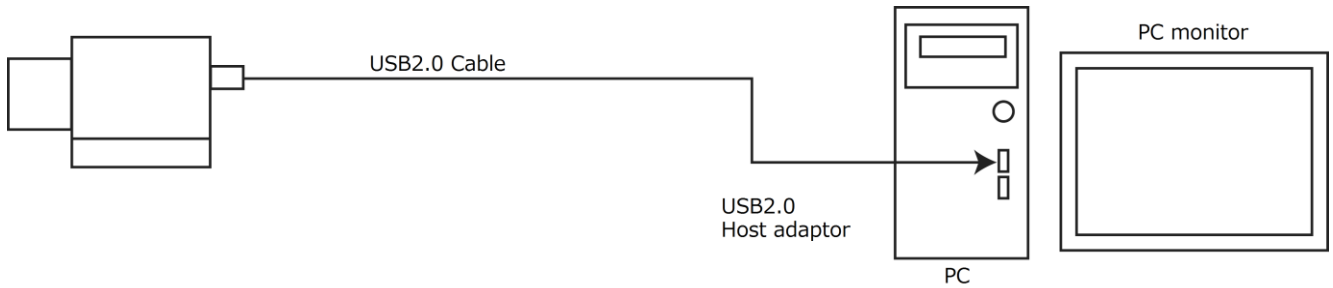
- 1) Camera
- 2) USB Cable Cased Type : One end of the cable integrated to the camera, 1.8m approx.
 Board Type : Type A USB cable, 1.8m approx.
- 3) Introduction Booklet
- 4) Viewer software/Device Driver CD

<Options>

- 1) C Mount lens
- 2) 2 Measurement & Filing Software [ART-MEASURE]
- 3) Recording Software [ART-REC]
- 4) Software Development Kit [ARTCCM-SDK]
- 5) LabView DLL
- 6) 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
445KY2 Series 445SS Series	Range : 2~1083(Exposure Time : 1/22500~1/20.79sec) Exposure Time=(1084 – Shutter Value)×1600×0.0278 [μsec] *at 36MHz
150PⅢSeries	Range : 8~1068(Exposure Time : 1/2234~1/12.5sec) Exposure Time=(1074 – Shutter Value)×1790×0.0417 [μsec] *at 24MHz
267KY Series	Range : 8~1068(Exposure Time : 1/3352~1/19.8sec) Exposure Time=(1074 – Shutter Value)×1790×0.0278 [μsec] *at 36MHz
274KY Series	Range : 2~1252(Exposure Time : 1/18750~1/15sec) Exposure Time=(1253 – Shutter Value)×1920×0.0278 [μsec] *at 36MHz
500P II Series	Range : 1~1013(Exposure Time : 1/8293~1/8.2sec) Exposure Time=2894× Shutter Value ×0.0417 [μsec] *at 24MHz
625KY Series	Range : 2~2079(Exposure Time : 1/9580~1/4.6sec) Exposure Time=(2080 – Shutter Value)×1924×0.0543 [μsec] *at 18.432MHz

6. Specifications

6-1 Color Model(1)

	ARTCAM- 445KY2 445KY2-OP 445KY2-OP-CM	ARTCAM- 445SS	ARTCAM- 150PⅢ 150PⅢ-OP 150PⅢ-OP-CM
Sensor Type	CCD Color Image Sensor		
Active Pixels	1296(H)×966(V)	1296(H)×966(V)	1392(H)×1040(V)
Active Imager Size	4.86(H)×3.62(V)mm 1/3"	4.86(H)×3.62(V)mm 1/3"	6.47(H)×4.83(V)mm 1/2"
Scan Mode	Progressive Scan		
Pixel Size	3.75(H)×3.75(V)μm	3.75(H)×3.75(V)μm	4.65(H)×4.65(V)μm
Shutter Type	Global Shutter		
Color Filter Array	RGB Bayer Pattern		
Frame Rate	22fps	22fps	12fps
Shutter Speed	1/22500~1/20.79s	1/22500~1/20.79s	1/2234~1/12.5s
Interface	USB2.0 Bulk Transfer		
Synchronization System	Internal Synchronization		
Lens Mount	C Mount (445KY2, 445KY2-OP-CM) Board Lens Mount M12 P0.5(445KY2-OP)	C Mount (445SS, 445SS-OP-CM) Board Lens Mount M12 P0.5(445SS-OP)	C Mount (150PⅢ, 150PⅢ-OP-CM) Board Lens Mount M12 P0.5(150PⅢ-OP)
Power	DC5V(Supplied by USB port)		
Power Consumption	Under Approx.2W		
Ambient Conditions	Operating Temperature/Humidity : 0~35°C/10~80%(Non condensing) Storage Temperature/Humidity : 0~60°C/10~95%(Non condensing)		
External Dimensions	Refer to section 7	Refer to section 7	Refer to section 7
Weight	Approx.100g(445KY2) Approx.20g(445KY2-OP) Approx.60g(445KY2-OP-CM) *Lens, tripod and cable not included	Approx.60g(445SS) *Lens, tripod and cable not included	Approx.100g(150PⅢ) Approx.20g(150PⅢ-OP) Approx.60g(150PⅢ-OP-CM) *Lens, tripod and cable not included

6-2 Color Model(2)

	ARTCAM- 267KY 267KY-OP 267KY-OP-CM	ARTCAM- 274KY 274KY-OP 274KY-OP-CM	ARTCAM- 500P II 500P II -OP-CM	ARTCAM- 625KY 625KY-OP-CM
Sensor Type	CCD Color Image Sensor			
Active Pixels	1392 (H)×1040(V)	1628(H)×1236(V)	2588(H)×1960(V)	2456(H)×2058(V)
Active Imager Size	6.47(H)×4.83(V)mm 1/2"	7.16(H)×5.44(V)mm 1/1.8"	8.80(H)×6.66(V)mm 2/3"	8.47(H)×7.10(V)mm 2/3"
Scan Mode	Progressive Scan		Interlace Scan	Progressive Scan
Pixel Size	4.65(H)×4.65(V)μm	4.4(H)×4.4(V)μm	3.4(H)×3.4(V)μm	3.45(H)×3.45(V)μm
Shutter Type	Global Shutter			
Color Filter Array	RGB Bayer Pattern			
Frame Rate	18fps	15fps	3.75fps	2.4fps
Shutter Speed	1/3352~1/19.8s	1/18750~1/15s	1/8293~1/8.2s	1/9580~1/4.6s
Interface	USB2.0 Bulk Transfer			
Synchronization System	Internal Synchronization			
Lens Mount	C Mount (267KY, 267KY-OP-CM) Board lens Mount M12 P0.5(267KY-OP)	C Mount (274KY, 274KY-OP-CM) Board lens Mount M12 P0.5(274KY-OP)	C Mount (500P II, 500P II -OP-CM)	C Mount (625KY, 625KY-OP-CM)
Power	DC5V(Supplied by USB port)			
Power Consumption	Under Approx.2W			
Ambient Conditions	Operating Temperature/Humidity : 0~35°C /10~80%(Non condensing) Storage Temperature/Humidity : 0~60°C /10~95%(Non condensing)			
External Dimensions	Refer to section 7	Refer to section 7	Refer to section 7	Refer to section 7
Weight	Approx.100g(267KY) Approx.20g(267KY-OP) Approx.60g(267KY-OP-CM) *Lens, tripod and cable not included	Approx.100g(274KY) Approx.20g(274KY-OP) Approx.60g(274KY-OP-CM) *Lens, tripod and cable not included	Approx.100g(500P II) Approx.60g(500P II -OP-CM) *Lens, tripod and cable not included	Approx.100g(625KY) Approx.60g(625KY-OP-CM) *Lens, tripod and cable not included

6-3 Monochrome Model(1)

	ARTCAM- 445KY2-BW 445KY2-BW-OP 445KY2-BW-OP-CM	ARTCAM- 445SS-BW	ARTCAM- 150P III-BW 150P III-BW-OP 150P III-BW-OP-CM
Sensor Type	CCD Monochrome Image Sensor		
Active Pixels	1296(H)×966(V)	1296(H)×966(V)	1392(H)×1040(V)
Active Imager Size	4.86(H)×3.62(V)mm 1/3"	4.86(H)×3.62(V)mm 1/3"	6.47(H)×4.83(V)mm 1/2"
Scan Mode	Progressive Scan		
Pixel Size	3.75(H)×3.75(V)μm	3.75(H)×3.75(V)μm	4.65(H)×4.65(V)μm
Shutter Type	Global Shutter		
Frame Rate	22fps	22fps	12fps
Shutter Speed	1/22500~1/20.79s	1/22500~1/20.79s	1/2234~1/12.5s
Interface	USB2.0 Bulk Transfer		
Synchronization System	Internal Synchronization		
Lens Mount	C Mount (445KY2-BW, 445KY2-BW-OP-CM) Board lens Mount M12 P0.5(445KY2-BW-OP)	C Mount (445SS-BW)	C Mount (150P III-BW, 150P III-BW-OP-CM) Board lens Mount M12 P0.5 (150P III-BW-OP)
Power	DC5V(Supplied by USB port)		
Power Consumption	Under Approx.2W		
Ambient Conditions	Operating Temperature/Humidity : 0~35°C/10~80%(Non condensing) Storage Temperature/Humidity : 0~60°C /10~95%(Non condensing)		
External Dimensions	Refer to section 7	Refer to section 7	Refer to section 7
Weight	Approx.100g(445KY2-BW) Approx.20g(445KY2-BW-OP) Approx.60g(445KY2-BW-OP-CM) *Lens, tripod and cable not included	Approx.60g(445SS-BW) *Lens, tripod and cable not included	Approx.100g(150P III-BW) Approx.20g(150P III-BW-OP) Approx.60g(150P III-BW-OP-CM) *Lens, tripod and cable not included

6-2 Monochrome Model(2)

	ARTCAM- 267KY-BW 267KY-BW-OP 267KY-BW-OP-CM	ARTCAM- 274KY-BW 274KY-BW-OP 274KY-BW-OP-CM	ARTCAM- 625KY-BW 625KY-BW-OP-CM
Sensor Type	CCD Monochrome Image Sensor		
Active Pixels	1392 (H)×1040(V)	1628(H)×1236(V)	2456(H)×2058(V)
Active Imager Size	6.47(H)×4.83(V)mm 1/2"	7.16(H)×5.44(V)mm 1/1.8"	8.47(H)×7.10(V)mm 2/3"
Scan Mode	Progressive Scan		
Pixel Size	4.65(H)×4.65(V)μm	4.4(H)×4.4(V)μm	3.45(H)×3.45(V)μm
Shutter Type	Global Shutter		
Frame Rate	18fps	15fps	2.4fps
Shutter Speed	1/3352~1/19.8s	1/18750~1/15s	1/9580~1/4.6s
Interface	USB2.0 Bulk Transfer		
Synchronization System	Internal Synchronization		
Lens Mount	C Mount (267KY-BW, 267KY-BW-OP-CM) Board lens Mount M12 P0.5(267KY-BW-OP)	C Mount (274KY-BW, 274KY-BW-OP-CM) Board lens Mount M12 P0.5(274KY-BW-OP)	C Mount (625KY-BW, 625KY-BW-OP-CM)
Power	DC5V(Supplied by USB port)		
Power Consumption	Under Approx.2W		
Ambient Conditions	Operating Temperature/Humidity : 0~35°C /10~80%(Non condensing) Storage Temperature/Humidity : 0~60°C /10~95%(Non condensing)		
External Dimensions	Refer to section 7	Refer to section 7	Refer to section 7
Weight	Approx.100g(267KY-BW) Approx.20g(267KY-BW-OP) Approx.60g(267KY-BW-OP-CM) *Lens, tripod and cable not included	Approx.100g(274KY-BW) Approx.20g(274KY-BW-OP) Approx.60g(274KY-BW-OP-CM) *Lens, tripod and cable not included	Approx.100g(625KY-BW) Approx.60g(625KY-BW-OP-CM) *Lens, tripod and cable not included

7. External Dimensions

7-1 C-MOUNT, CASED, USB CABLE TYPE

ARTCAM-445KY2/445KY2-BW

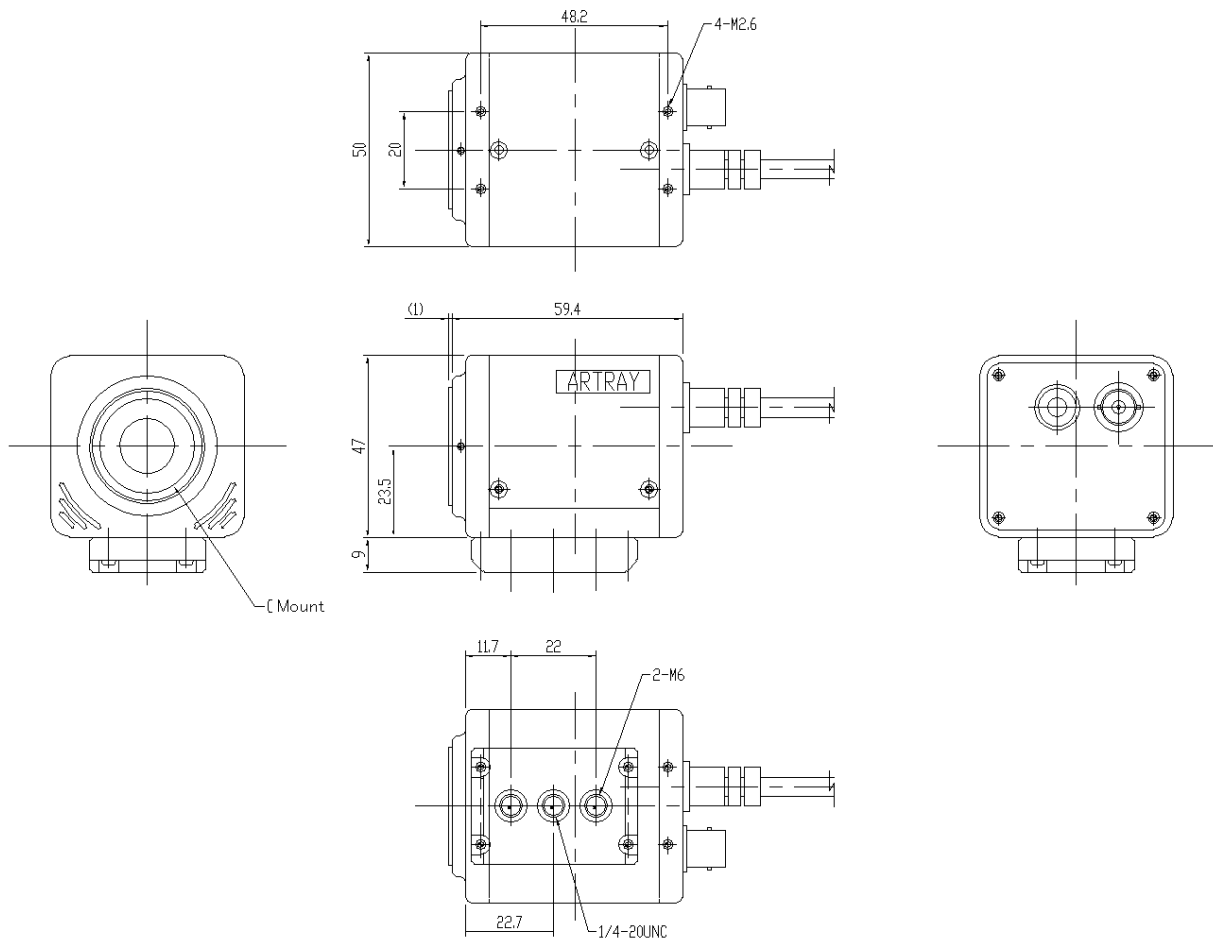
ARTCAM-150PⅢ/150PⅢ-BW

ARTCAM-267KY/267KY-BW

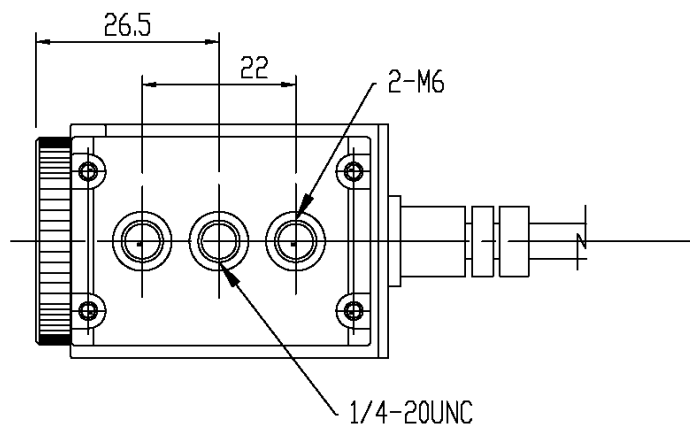
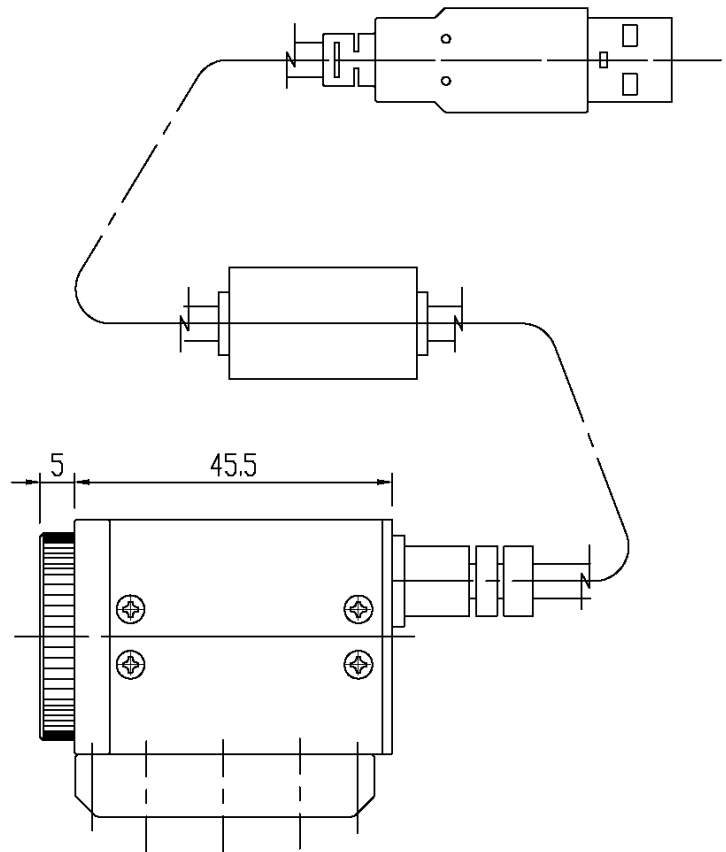
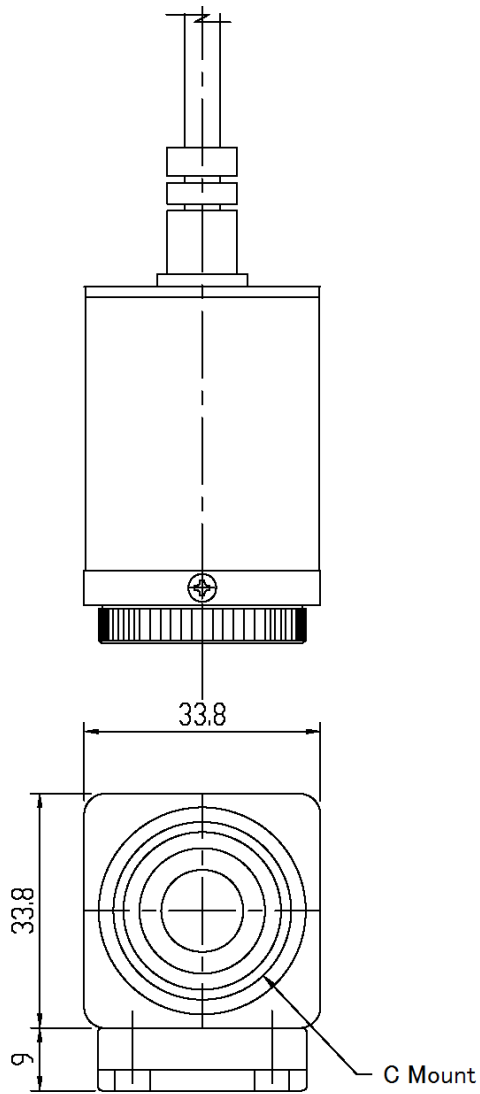
ARTCAM-274KY/274KY-BW

ARTCAM-500PⅡ

ARTCAM-625KY/625KY-BW



7-2 C-MOUNT, CASED (MINI CASE) USB CABLE TYPE
ARTCAM-445SS/445SS-BW



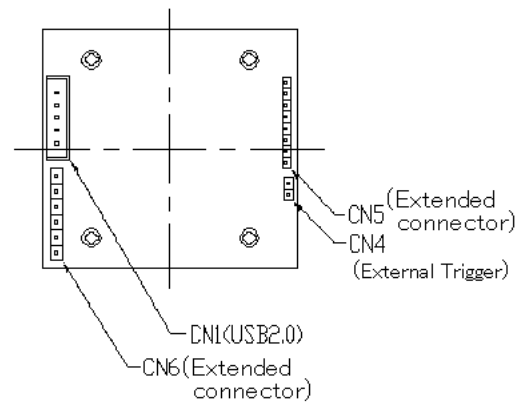
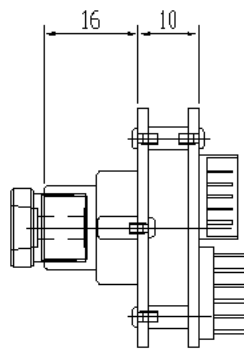
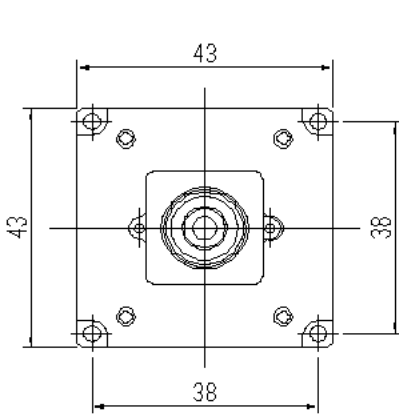
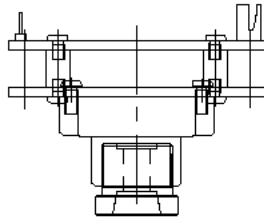
7-3 BOARD LENS, BOARD TYPE

ARTCAM-445KY2-OP/445KY2-BW-OP

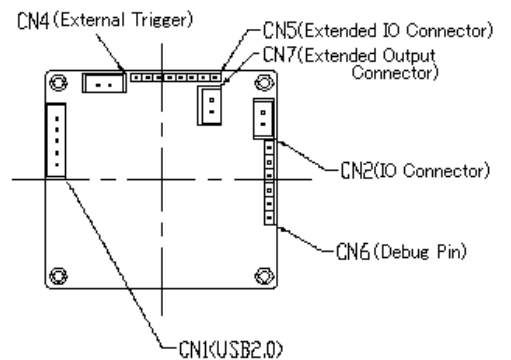
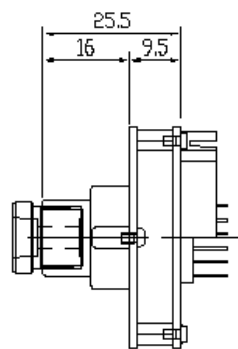
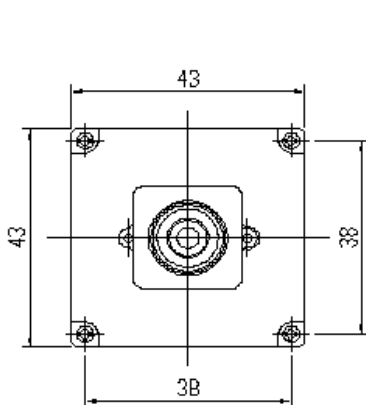
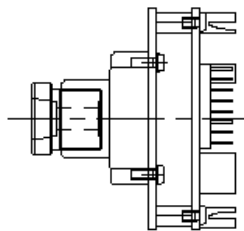
ARTCAM-150PⅢ-OP/150PⅢ-BW-OP

ARTCAM-267KY-OP/267KY-BW-OP

ARTCAM-274KY-OP/274KY-BW-OP

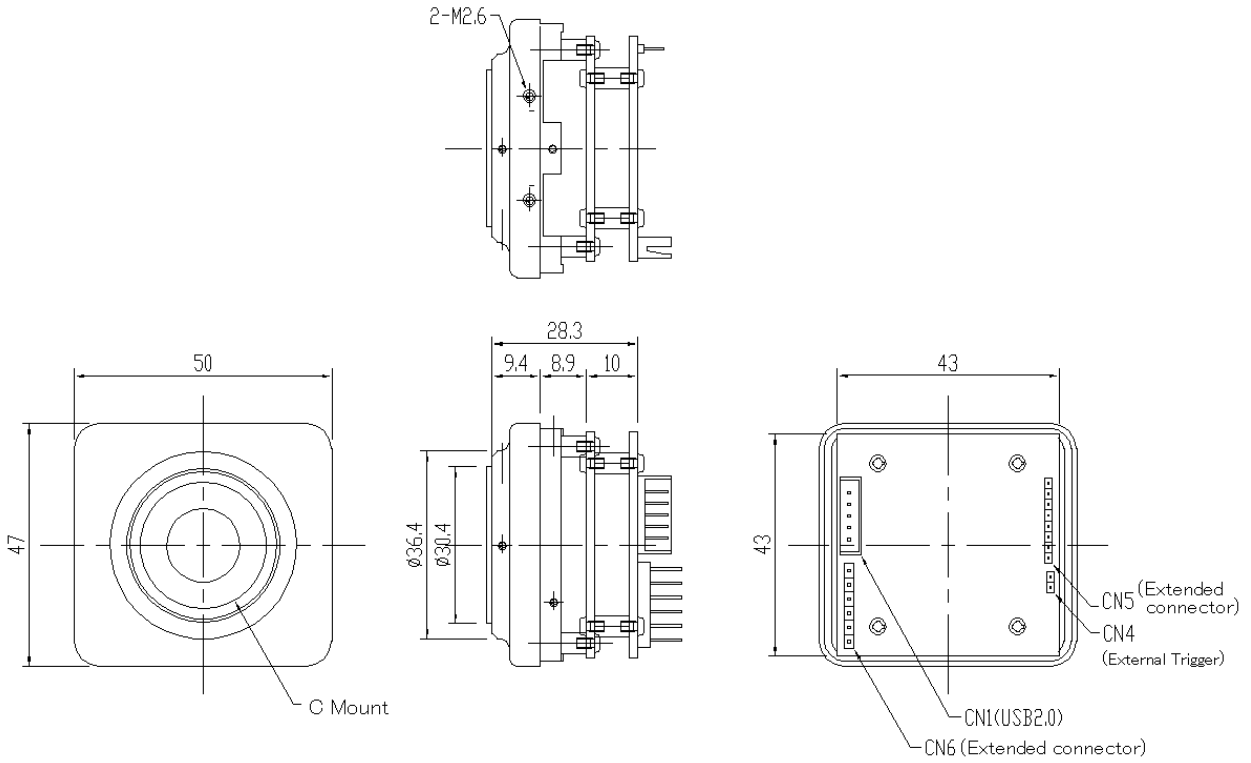


*Design of the boards has been changed as following after Aug 2011.
Please contact your sales representative for details.

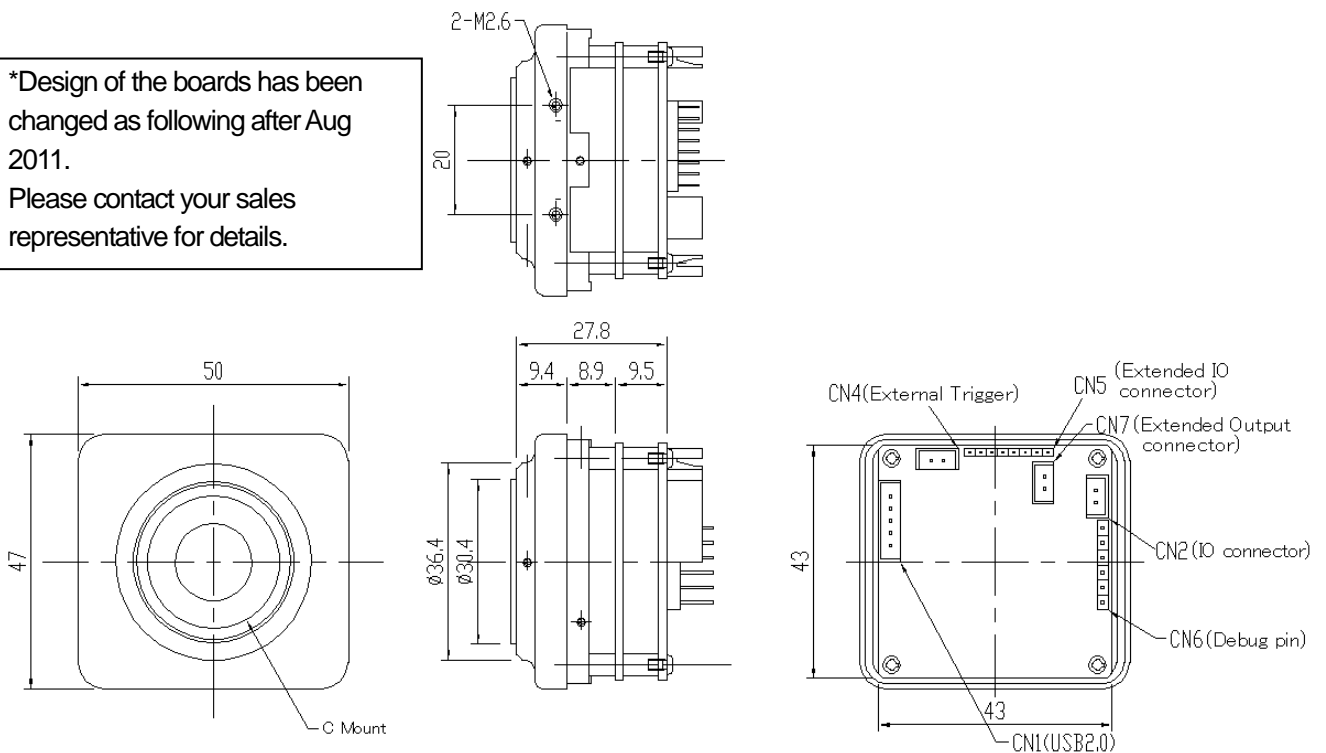


7-4 C-MOUNT, BOARD TYPE

- ARTCAM-445KY2-OP-CM/445KY2-BW-OP-CM
- ARTCAM-150P III-OP-CM/150P III-BW-OP-CM
- ARTCAM-267KY-OP-CM/267KY-BW-OP-CM
- ARTCAM-274KY-OP-CM/274KY-BW-CM
- ARTCAM-500P II-OP-CM
- ARTCAM-625KY-OP-CM/625KY-BW-OP-CM



*Design of the boards has been changed as following after Aug 2011.
Please contact your sales representative for details.

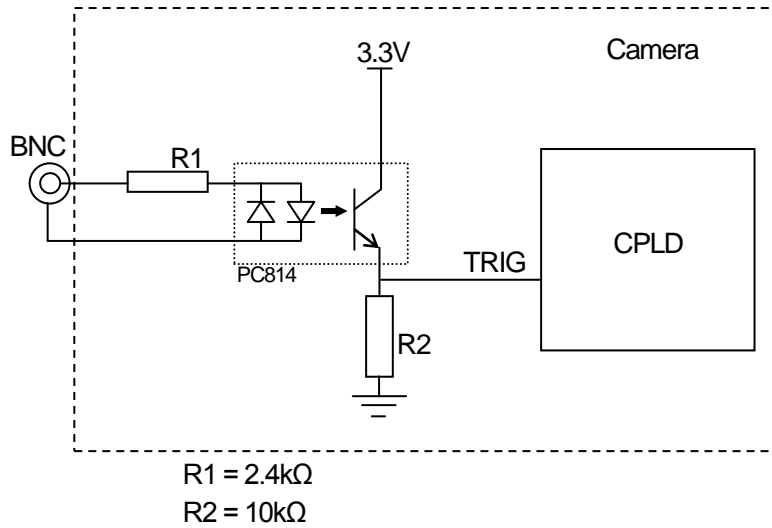


8. External Trigger

8-1. Trigger Input

ARTCAM-445KY2 / 150PⅢ/ 267KY / 274KY / 500PⅡ / 625KY series are designed with external trigger.

Trigger Input Circuit



9. Recommended PC

- Intel chip set, Southbridge above ICH5

OS : Windows XP / Vista / 7

CPU	Pentium4 Above 2.4GHz
Memory	Above 768M

*The camera may not work properly with some PCs(if USB host chips are other than AMD and Intel)



Caution

■Please refer the restrictions below when you use ARTCAM.

(1)USB host chip

Please use Intel authorized USB2 host controller.

Make sure that you find "Intel(R) 82801DB/DBM USB2 ENHANCED HOST CONTROLLER" on USB Controller window.

The direction is as below :

"Control Panel" -> "Hardware" -> "Device Manager" -> "USB Controller"

NOTE : We do not guarantee the proper operation of this camera on external USB host cards.

Based on the design, the external USB host card may have a slow transfer rate as being connected to a host via PCI bus.

(2)Hyper Thread Bios

Please disable this function in case your PC has a built-in Intel hyper thread.

(3)Use of other USB2.0 hardware

The data on our camera/converter is transferred in bulk mode. For this reason, when using our camera/converter, please avoid using other bulk transferred USB2.0 hardware such as Memory stick, External HDD, External DVD, CDROM and etc.

Especially if the PC adopts a Cypress control chip, it may not recognize the later connected bulk transfer device if the device is connected when the Artray camera is in function. This issue is hard to be solved because the problem is on the lower firmware of the control chip and the PC bios.

As a solution, we recommend to install a PCI USB host card to the PC and connect external USB hardware to this port only.

(4)USB2.0 cable Extension

We cannot guarantee the proper operation of the extension cable even it is compatible with USB2.0 unless the extension cable is confirmed by us. This is because the USB transfer frequency of this camera is 192MHz.

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

*For the recommended extension cable, please contact our sales department. (TEL : +81-3389-5488)

Users may encounter problems such as "Camera error", "Disappearance of Device driver", " Operation error in high-speed mode", "Unknown USB device" and etc. if an unconfirmed extension cable is used.



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