February 7,2005

2M pixels progressive
USB2.0 COLOR CMOS CAMERA

ARTCAM-200MI

INSTRUCTION BOOKLET

ARTRAY CO.,LTD.

Contents

1. Description

ARTCAM-200MI is a 1/2" CMOS color camera developed for industrial use.
Image can be saved directly to your PC with high-speed transfer via USB2.0 interface.

2. Main Features

* High sensitivity and high resolution

  Max.resolution of 1600 x 1200 pixels. Image size can be altered.

* Flange-back adjustment

  With Artray's original mechanism, flange-back is adjustable
  while real-time image is displayed.

* Electric shutter

  Shutter speed can be adjusted on software screen.

* Frame rate

  Frame rates are different for 8 bits model and 10 bits model.

Size	8 bits（FPS）	10 bits（FPS）
UXGA(1600×1200)	10	5
SXGA(1280×1024)	15	8
XGA(1024×768)	21	10
VGA(640×480)	46	22

* Gain

  "Gain" can be controlled from the PC.

* Offset

  "Offset" can be controlled from the PC.

* Sub-sampling function

  "Sub-sampling function" (which maintains the same image size while roughing image quality) is available.This will increase the fame rate.

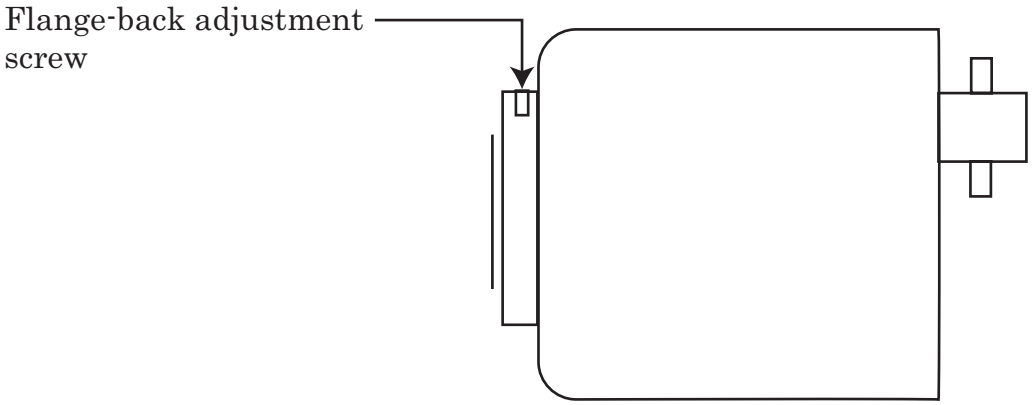
3. List of Items

1) Camera 1(equiopped with tripod breaket, but not lens)
2) User Instruction 1
3) Software CD 1

《Option》
1)Filing & 2D measuring system
2)SDK(ARTCAM-200MI-SDK)
3)5.0m camera cable

4. Position of Each Part

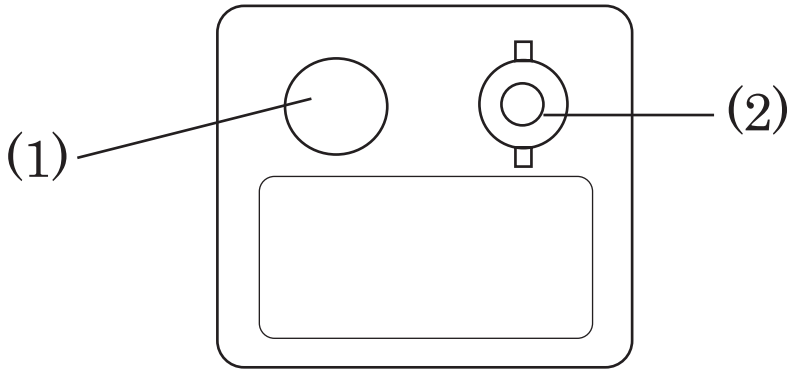
4-1 Side panel



Caution

Do NOT remove the cover. This may break camera or cause static electricity.

4-2 Back panel

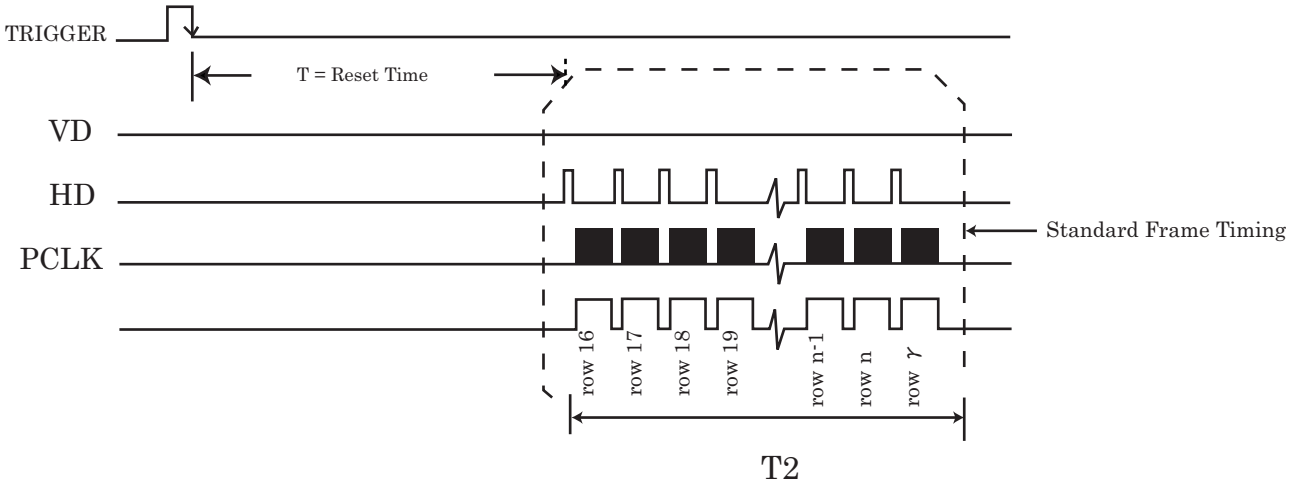


(1) USB
:USB2.0 interface cable

(2) TRG (BNC)
:External contact trigger

4-3 EXTERNAL TRIGGER

1. Timing



Remark1 : T is the time required for reset. Time required for each model is as below.
Start reset from trailing edge of trigger terminal.

ARTCAM-130MI ---> 70msec approx.

ARTCAM-200MI ---> 100msec approx.

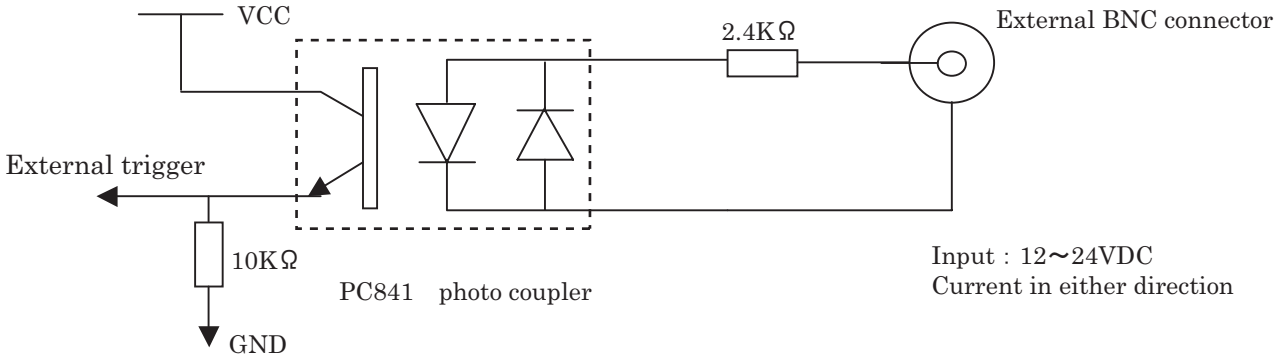
ARTCAM-300MI ---> 170msec approx.

(These values are for dafault resolution)

Remark2 : The actual time for capturing is at least twice as long as the time indicated in Remark1 (@ 8 bits).
T2 is the transfer time. IsCaptureFinish() is returned when T2 is completed.

2. External trigger hardware

Remark3 : Serial NO01508 has been altered to photo-isolation type as below.
The following is the internal equivalent circuit.



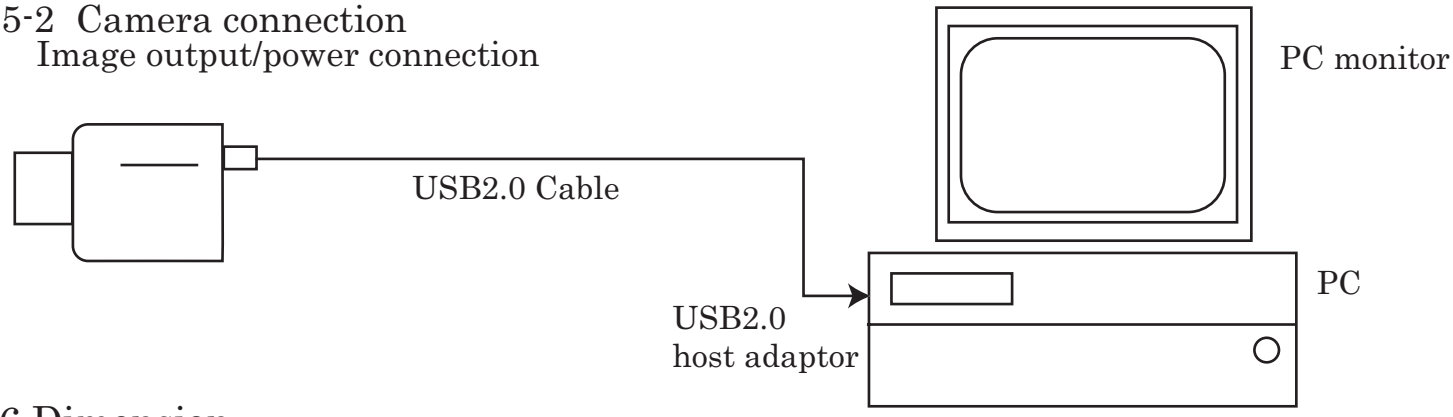
5. Functions and operation

5-1 Selection of lens

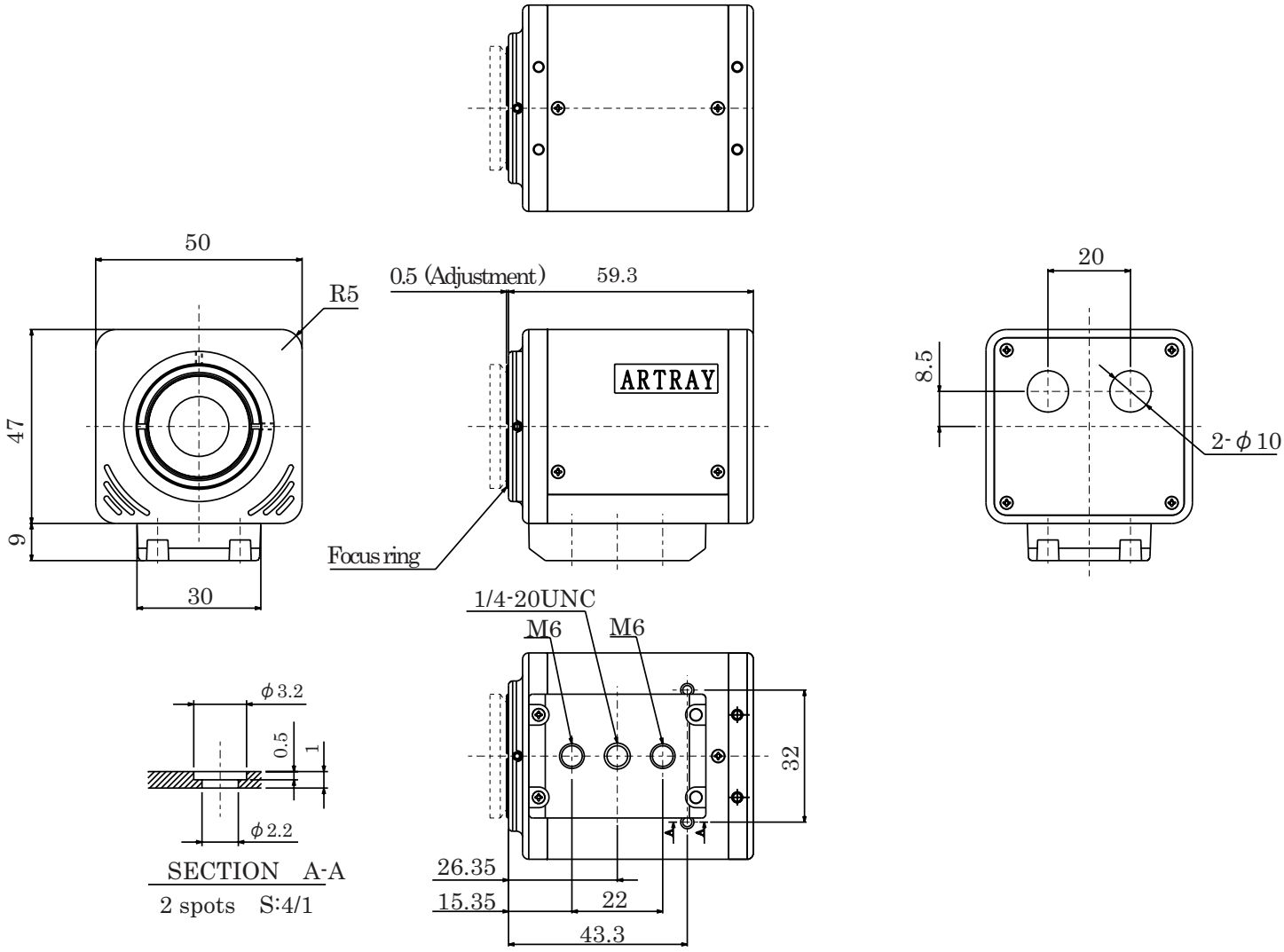
The mount of lens is C-mount.
C-mount fixing screw is installed in the camera.

5-2 Camera connection

Image output/power connection



6.Dimension



7. Specifications of camera

	ARTCAM-200MI
1. Image pick up device	1/2"CMOS
2. Color mothod	Single-panel CMOS color method
3. Max. resoluion	2M pixel
4. Lens size	1/2"format
5. Soan mode	Progressive
6. Pixel size	4.2μm x 4.2μm(6.7×5.0mm pixel areas)
7. S/N ratio	50dB
8. Sensitivity	1.2V/Lux-sec(550nm)
9. Electric shutter mode	Manual 1/30-1/1800
10. White balance	Manual/auto, switchable
11. Synchro system	Internal syschro
12. Flange back	Manual adjustment
13. Lens mount	C mount(Lens is NOT included)
14. Offset	Manual adjustment
15. Gain	Manual adjustment
16. Power supply	DC+5V
17. Power condensing	2.0W approx
18. Ambient temperature and humiding	0-35℃(recommended), 80%(non-condensing)
19. Dimension and weight	50(W)×56(H)×59.3(D)mm,180g approx

Electric characteristics

NO	Parameter	SPEC	Comment	Remark
1	Power	+5V 0.4A		supplied by USB port
2	Shutter control	Manual adjustment		software control
3	Gain control	Manual adjustment		software control
4	S/N ratio	50dB		
5	γ characteristics	1.0 fixed		
6	Power consumption	<2.0W		
7	Image interface	USB2, digital output		

Image pick up device

NO	Parameter	SPEC	Comment	Remark
1	Imager	MT9D001		
2	Optical size	Equivalent to 1/2"		
3	Total resolution	1632 x 1224		
4	Max resolution	1600 x 1200		
5	Pixel size	4.2 x 4.2um		
6	Sensitivity	1.2V/Lux-sec(550nm)		
7	IR cutting filter	color:have		

Physical specifications

NO	Parameter	SPEC	Comment	Remark
1	Lens	C mount		
2	Max weight	<180g (with cable)		
3	Dimension	50 x 56 x 59.3mm		
4	Material of enclosure	Aluminium		

Operating environment

NO	Parameter	SPEC	Comment	Remark
1	Operating temperature	-10-50℃ (10-95%RH、non-condesing)		
2	Storage temperature	-35-80℃ (10-95%RH、non-condesing)		
3	MTBF	70K hours(at 60℃)		
4	EMI	EN61000-6-4		
5	EMS	EN61000-6-2		
6	Vibration	Acceleration:29.4M/S Frequency:5-200Hz Sweep cycle:10min Test time: Ups and down 2h Left and right 2h Back and fouth 2h Tesk OK		

Technical standard

NO	Parameter	SPEC	Comment	Remark
1	UL approved	Materials used in wiring are compliant with UL. Storage temperature (10-95%RH, non-condensing)		
2	CE	Some models are CE certified		

<<System requirements>>
PCs which use south-bridge of ICH4,ICH5 and ICH6 are recommended
*CPU: Pentium4 1.7GHz or higher
Embedded USB2.0 port (PCI/PCMCIA USB2.0 ports are not compliant)
*Memory 512MB or higher
*OS Windows 2000(SP4)/XP(SP1)

ARTRAY CO.,LTD.

Ueno bldg, 1-17-5 Kouenjikita Suginami-ku,
Tokyo 166-0002 Japan
Tel:(81)3(3389)5488 Fax:(81)3(3389)5486
Email: artray@artray.co.jp
URL: http://www.artray.co.jp

Refer to the restrictions below when using ARTCAM/ARTCNV

1. USB host chip

Use the USB host chip which is Intel authorized USB2 host controller.
Make sure if you find "Intel®82801DB/DBM USB2 ENHANCED HOST CONTROLLER" on USB Controller window according to the following procedure.

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

NOTICE: We cannot guarantee the proper operation of this camera/converter when you use the external USB host card due to its design and its transfer rate. The transfer speed is slow because it is connected to host via PCI bus. In case of using ARTCNV, color transfer is not available. (Only Monochrome.)

2. Hyper Thread Bios

Disable this function in case of PC with a built-in Intel hyper thread.

3. With the other USB2.0 hardware

You may be unable to use the other USB2.0 hardware such as Memory stick, External HDD, External DVD, CDROM and etc. when you use this camera/converter due to bulk transfer mode of this camera/converter.
It is because bulk transfer device is not recognized, especially in case of Cypress control chip, due to handshaking of USB port and PC bios.
It is hard to solve this matter for the reason that it is related to the lower firmware of control chip and PC bios.
As a recommended measure, add PCI USB host card on PC and use its USB ports for the external USB hardware.

4. Extension of USB2.0 cable

We cannot guarantee the proper operation of the extension cable even though it is compatible with USB2.0 except the extension cables below we have confirmed its proper operation because USB transfer frequency of this camera is 192MHz.

For the recommended extension cable, we refer you to our sales dep't. (TEL: +81-3-3389-5488)

In case of the trouble using the extension cable, you may have "Camera error", "Disappearance of Device driver", " Operation error in high-speed mode", "Unknown USB device" and etc.