CREVIS

User Manual

USB 2.0 FA Cameras

MINICAM

Version 1.0

REVISION HISTORY

Rev.	Model	Data	Description	Page
0.1	ALL	2008-09-17	Established	
0.2	ALL	2008-10-09	revised Table	6
			added 1.4 Mechanical drawings of Overlap	8
			function	11
0.3	ALL	2008-10-23	revised Demo Program	9
			added Troubleshooting	26
0.4	ALL	2009-06-30	added specification of color and board models	6~9
			changed pictures of control panel.	17~23
			added functions of board models.	22, 32
0.5	ALL	2009-07-16	Revised 22dB into 24dB.	20
0.6	ALL	2009-08-27	Added notices	
0.7	ALL	2009-08-31	Modified specifications	6
0.8	ALL	2009-11-16	Added PC Spec.	6~9
			Added the functions of sharpness	26
0.9	ALL	2010-02-09	Added the function of BinningHorizontal	18
			Added the function of InterpolationModel	20
1.0	Color	2010-08-17	added Troubleshooting	34
1.1	Board type	2011-02-11	changed pictures of board type camera.	12

The features and specifications, and other information provided in this preliminary data sheet, are subject to change without notice. Crevis co., Ltd. Reserves the right to make design changes without prior warning.

Contents

1. General

1.1 Components

Fig 1: Install CD

Fig 2: Instruction Manual

Fig 3: USB Cable

TRG+
TRG-
Strobe-
Strobe+

1 : DAMP+
2 : DAMP-
3 : GNA
4 : DRV+

4
3
2
1

Top View

50mm
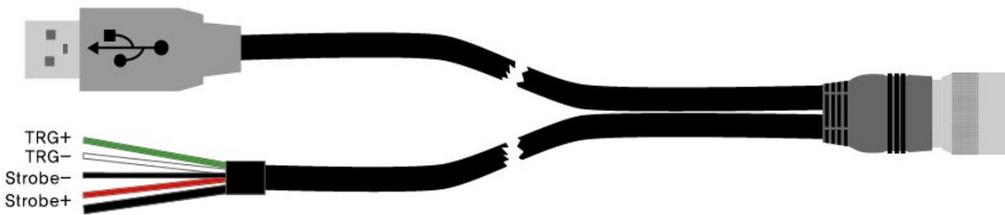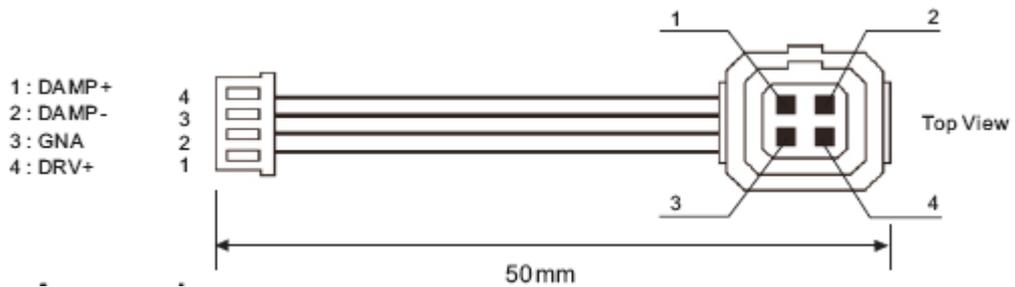
Fig 4: DC-iris cable

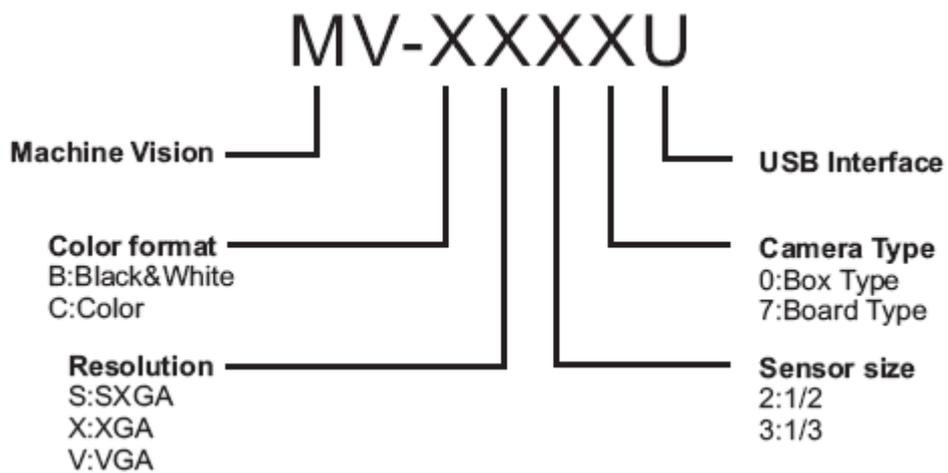| No.	Accessory	Quantity	Reference
①	Instruction Manual	1EA	
②	Install CD	1EA	
③	USB dedicated Cable	1EA	Option
④	Auto DC-Iris Cable	1EA	Option(Only board type)

1.2 System Requirements

- PC with at least one USB2.0-interface
- PC with CPU Clock
  Monochrome Models : at least 1.6GHz
  Color Models   : at least 3.0GHz
- OS : Win2000, WinXP, Win Vista 32-Bit
- The USB 2.0 Port must support a 500mA.
- USB2.0 certified cables should be used.

☞ **Notice**

- USB 2.0 PCMCIA Card may not work with USB 2.0
- This camera do not support USB1.1

1.3 Specifications

The model name is given according to below table.

MV-XXXXU

Machine Vision

Color format
B:Black&White
C:Color

Resolution
S:SXGA
X:XGA
V:VGA

USB Interface

Camera Type
0:Box Type
7:Board Type

Sensor size
2:1/2
3:1/3

1) Products specifications

– Monochrome Models(Box Type)

Item	MV-BS20U	MV-BX30U	MV-BV30U / BV20U
Resolutions	1280 X 1024	1024 X 768	640 X 480
Pixel size	4.65㎛ X 4.65㎛	4.65㎛ X 4.65㎛	7.4㎛ x7.4㎛ / 9.9㎛ x9.9㎛
Optical senor class	1/2"	1/3"	1/3" / 1/2"
Pixel Clock	28.6363MHz		
Frame Rates	15fps	30fps	70fps
Binning	X2		
HRS	1/2, 1/4, 1/6	1/2, 1/3, 1/4	1/2, 1/3, 1/4
Exposure Trigger	Random Trigger Pulse width/Fixed Shutter		
Trigger Level	Low Level : 0 ~2V, High Level: 5 ~ 24V (Isolation Voltage 50V)		
Gain	0dB ~ 24dB		
Shutter	125us ~ 66.9ms	88.9us ~ 35.2ms	54.6us ~ 14.3ms
Gamma	Off(1), 0.45, 0.7, Table(Adjustable)		
SNR	58dB	58dB	60dB
Min, Illumination	1.0lx(F1.4)	2.0lx(F1.4)	1.0lx(F1.4)
Video Output	Mono 8bit, 10bit		
Optical Axis Accuracy	Pixel Center ±0.1mm		
Vibration(20~200Hz) Sweep interval : 300sec Test Time: 10min(XYZ Dir)	10G		
Power	USB Bus power(DC5V) , <2.5W		
Dimension	29mm X 29mm X 29mm(Without mount)		
Operating temperature	Performance Guaranteed : 0℃ ~ +40℃ (Operation Guaranteed : -5℃ ~ +45℃)		
Operating Humidity	20 ~ 80%RH		
Weight	Approx. 44g		
USB Driver	Win2000, WinXP, Win Vista(x86), Win 7(x86)		
USB Viewer/SDK	Win2000, WinXP, Win Vista x86, Win 7-x86, C/C++		
CE	EN61326-1 Class A		
RoHS	RoHS Compliant		

– Color Models(Box Type)

Item	MV-CS20U	MV-CX30U	MV-CV30U
Resolutions	1280 X 1024	1024 X 768	640 X 480
Pixel size	4.65㎛ X 4.65㎛	4.65㎛ X 4.65㎛	7.4㎛ x7.4㎛
Optical senor class	1/2"	1/3"	1/3"
Pixel Clock	28.6363MHz		
Frame Rates	15fps	30fps	70fps
Binning	Not supported		
HRS	1/2, 1/4, 1/6	1/2, 1/3, 1/4	1/2, 1/3, 1/4
Exposure Trigger	Random Trigger Pulse width/Fixed Shutter		
Trigger Level	Low Level : 0 ~2V, High Level: 5 ~ 24V (Isolation Voltage 50V)		
Gain	0dB ~ 24dB		
Shutter	125us ~ 66.9ms	88.9us ~ 35.2ms	54.6us ~ 14.3ms
Gamma	Off(1), 0.45, 0.7, Table(Adjustable)		
SNR	58dB	58dB	60dB
Min, Illumination	2.0lx(F1.4)	3.0lx(F1.4)	2.0lx(F1.4)
Video Output	Mono8, BayerBG8, RGB8Packed		
Optical Axis Accuracy	Pixel Center ±0.1mm		
Vibration(20~200Hz) Sweep interval : 300sec Test Time: 10min(XYZ Dir)	10G		
Power	USB Bus power(DC5V) , <2.5W		
Dimension	29mm X 29mm X 29mm(Without mount)		
Operating temperature	Performance Guaranteed : 0℃ ~ +40℃ (Operation Guaranteed : -5℃ ~ +45℃)		
Operating Humidity	20 ~ 80%RH		
Weight	Approx. 44g		
USB Driver	Win2000, WinXP, Win Vista(x86), Win 7(x86)		
USB Viewer/SDK	Win2000, WinXP, Win Vista x86, Win 7-x86, C/C++		
CE	EN61326-1 Class A		
RoHS	RoHS Compliant		

– Monochrome Models(Board Type)

Item	MV-BS27U	MV-BX37U	MV-BV37U
Resolutions	1280 X 1024	1024 X 768	640 X 480
Pixel size	4.65μm X 4.65μm	4.65μm X 4.65μm	7.4μm x7.4μm
Optical senor class	1/2"	1/3"	1/3"
Pixel Clock	28.6363MHz		
Frame Rates	15fps	30fps	70fps
Binning	X2		
HRS	1/2, 1/4, 1/6	1/2, 1/3, 1/4	1/2, 1/3, 1/4
Exposure Trigger	Random Trigger Pulse width/Fixed Shutter		
Trigger Level	TTL Level		
Gain	0dB ~ 24dB		
Shutter	125us ~ 66.9ms	88.9us ~ 35.2ms	54.6us ~ 14.3ms
Gamma	Off(1), 0.45, 0.7, Table(Adjustable)		
SNR	58dB	58dB	60dB
Min, Illumination	1.0lx(F1.4)	2.0lx(F1.4)	1.0lx(F1.4)
Video Output	Mono 8bit, 10bit		
DC-Iris	Supported		
IO Functions	GPIO 2 Ports(TTL level)		
Power	USB Bus power(DC5V) , <2.5W		
Dimension	40mm X 40mm X 10mm(Without mount)		
Operating temperature	Performance Guaranteed : 0℃ ~ +40℃ (Operation Guaranteed : -5℃ ~ +45℃)		
Operating Humidity	20 ~ 80%RH		
Weight	Approx. 38g		
USB Driver	Win2000, WinXP, Win Vista(x86), Win 7(x86)		
USB Viewer/SDK	Win2000, WinXP, Win Vista x86, Win 7-x86, C/C++		
CE	EN61326-1 Class A		
RoHS	RoHS Compliant		

– Color Models(Board Type)

Item	MV-CS27U	MV-CX37U	MV-CV37U
Resolutions	1280 X 1024	1024 X 768	640 X 480
Pixel size	4.65㎛ X 4.65㎛	4.65㎛ X 4.65㎛	7.4㎛ x7.4㎛
Optical senor class	1/2"	1/3"	1/3"
Pixel Clock	28.6363MHz		
Frame Rates	15fps	30fps	70fps
Binning	Not supported		
HRS	1/2, 1/4, 1/6	1/2, 1/3, 1/4	1/2, 1/3, 1/4
Exposure Trigger	Random Trigger Pulse width/Fixed Shutter		
Trigger Level	TTL Level		
Gain	0dB ~ 24dB		
Shutter	125us ~ 66.9ms	88.9us ~ 35.2ms	54.6us ~ 14.3ms
Gamma	Off(1), 0.45, 0.7, Table(Adjustable)		
SNR	58dB	58dB	60dB
Min, Illumination	2.0lx(F1.4)	3.0lx(F1.4)	2.0lx(F1.4)
Video Output	Mono8, BayerBG8, RGB8Packed		
DC-Iris	Supported		
IO Functions	GPIO 2 Ports(TTL level)		
Power	USB Bus power(DC5V) , <2.5W		
Dimension	40mm X 40mm X 10mm(Without mount)		
Operating temperature	Performance Guaranteed : 0℃ ~ +40℃ (Operation Guaranteed : -5℃ ~ +45℃)		
Operating Humidity	20 ~ 80%RH		
Weight	Approx. 38g		
USB Driver	Win2000, WinXP, Win Vista(x86), Win 7(x86)		
USB Viewer/SDK	Win2000, WinXP, Win Vista x86, Win 7-x86, C/C++		
CE	EN61326-1 Class A		
RoHS	RoHS Compliant		

2) Pin assignment for 12pin-circular connector

- Box Type
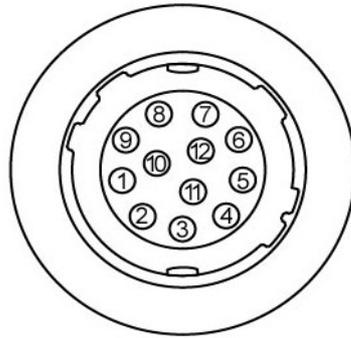
12pin-circular connector

Pin	Name	IN/OUT	Reference
1	Strobe -	GND1	
2	Power	IN	USB Bus +5Vdc
3	GND	IN	
4	NC	-	
5	USB D-	IN/OUT	
6	USB D+	IN/OUT	
7	GND	IN	
8	Trigger +	IN	Isolation(50V)
9	Trigger -	GND2	
10	Strobe+	OUT	Open Collector
11	GND	IN	
12	GND	IN	

- Board Type

- CON1(53261-0610)
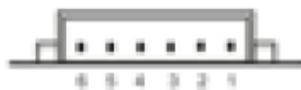
1. GND : Black
2. Trigger(Input) : Red
3. Strobe(Output) : Blue
4. GPIO 1(I/O) : Green
5. GPIO 2(I/O) : Green
6. GND : Black

- CON2(53048-0410)
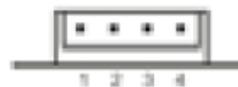
1. DAMP +
2. DAMP -
3. GND
4. DRV +

* CON1 : No opto-coupler, TTL Compatible.

1.4 Dimension (mm)
– Box Type
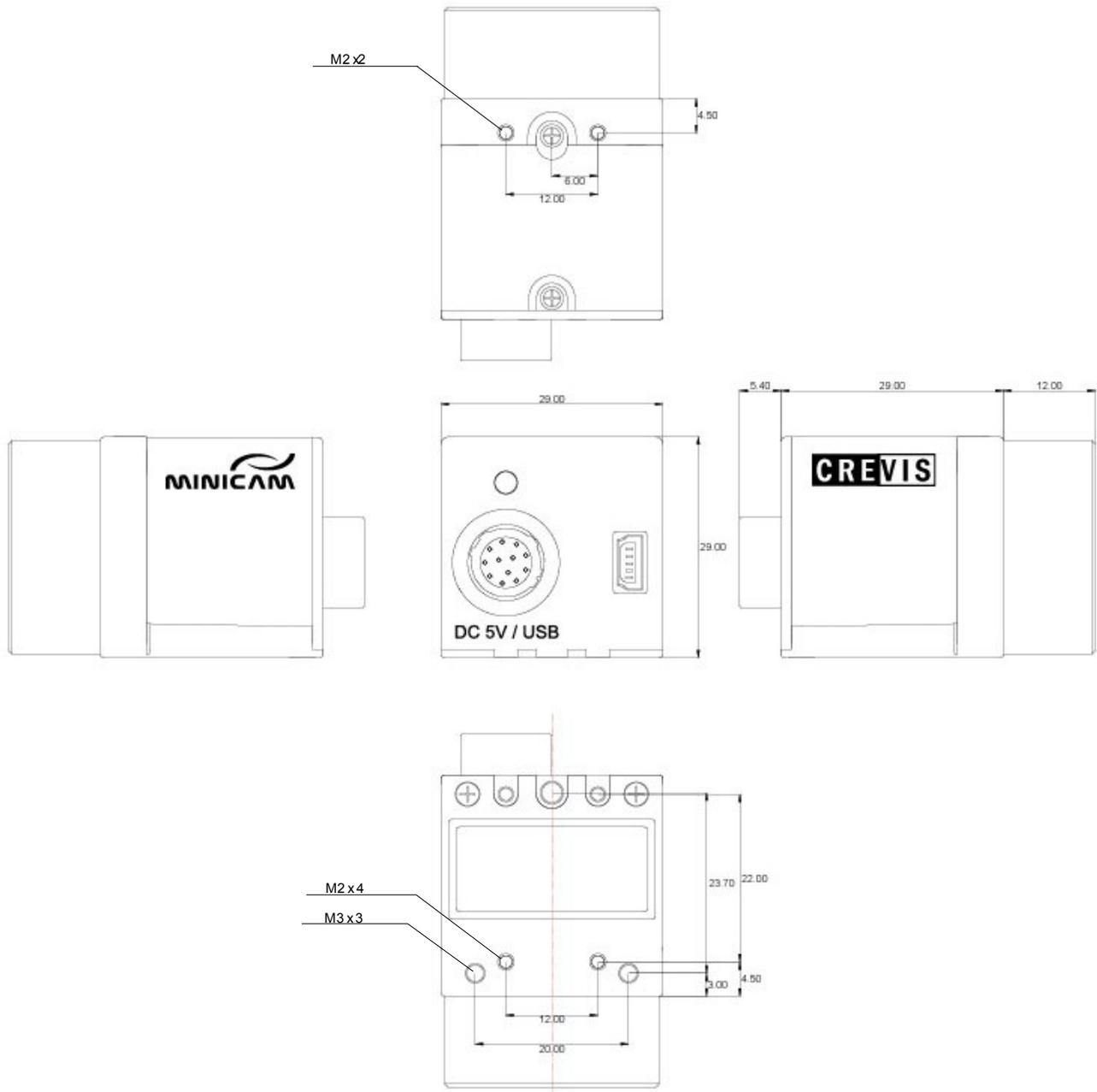
- Board Type
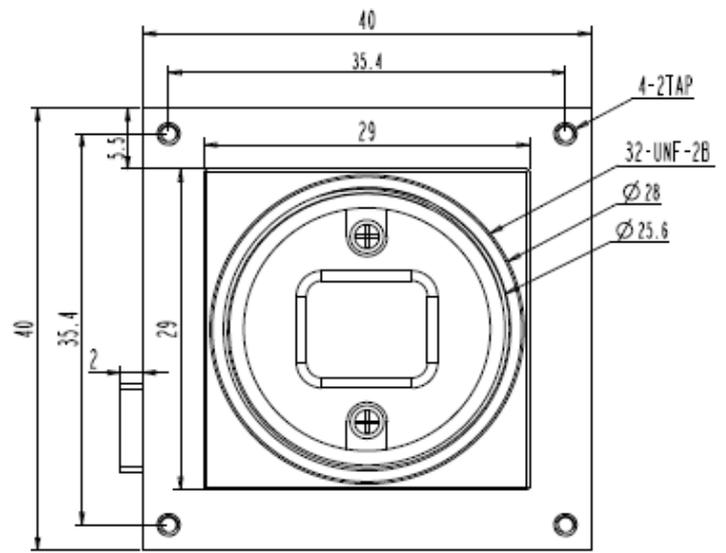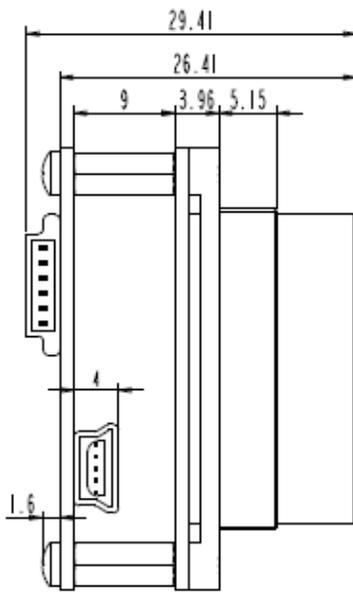
2 . Demo Program

McamU Demo is the application program provided for testing USB camera.

2.1 McamU Demo
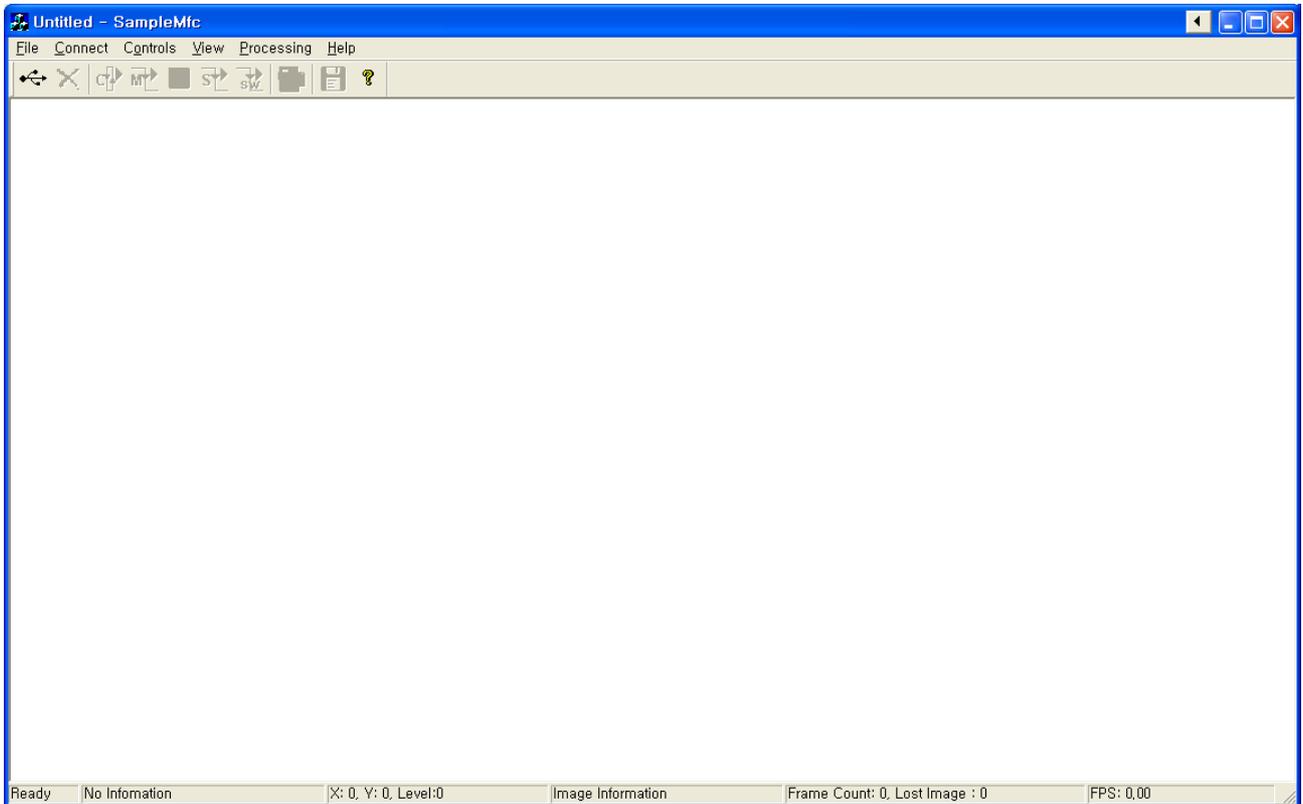
2.1.1 Start

Please, Check to change RED to GREEN on rear LED when USB Camera connect with PC.
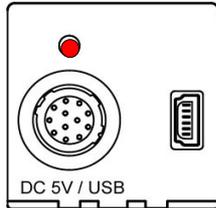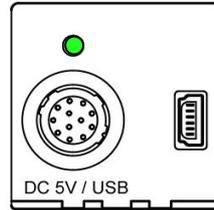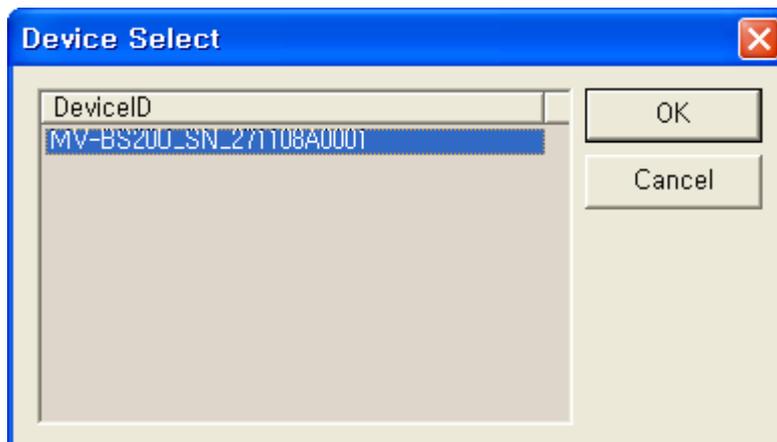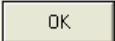

Fig 5: Driver not loaded

Fig 4: Driver loaded and camera ready

Press the button, then it's appeared as below figure about Device Select.

Then, select the MV-BS200_SN_271108A0001 and press the OK button. The C, M, S button is to be activated.

2.1.2 Demo menus

Toolbars	Menus	Contents
	File	
💾	Save	Save as bitmap or JPG File.
	Connect	
⛛	Open Camera	Connect to camera
✕	Close Camera	Disconnect from camera
	Controls	
C▶	Grab Continuous	Get and Display images continuously.
M▶	Grab Multi	Get and Display multiple images.
S▶	Grab Single	Get and Display an images
SW▶	SW Trigger	Get images through software trigger. Automatically Trigger mode is to be ON.
■	Stop	Stop the Image grabbing
▮	Control Panel	Open the control panel
	View	
	Toolbar	Toolbar's Display selection
	Status Bar	Status Bar display model name, current location, resolution, pixel format, frame count and frame rate.
	Processing	
	Sharpening	Open Sharpening dialog
	Help	
❓	About SampleMfc...	Demo information.

About SampleMfc

SampleMfc Version 2.0.0.1

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OK
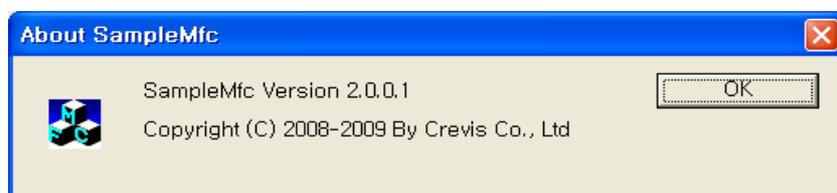
2.1.3 Status bar

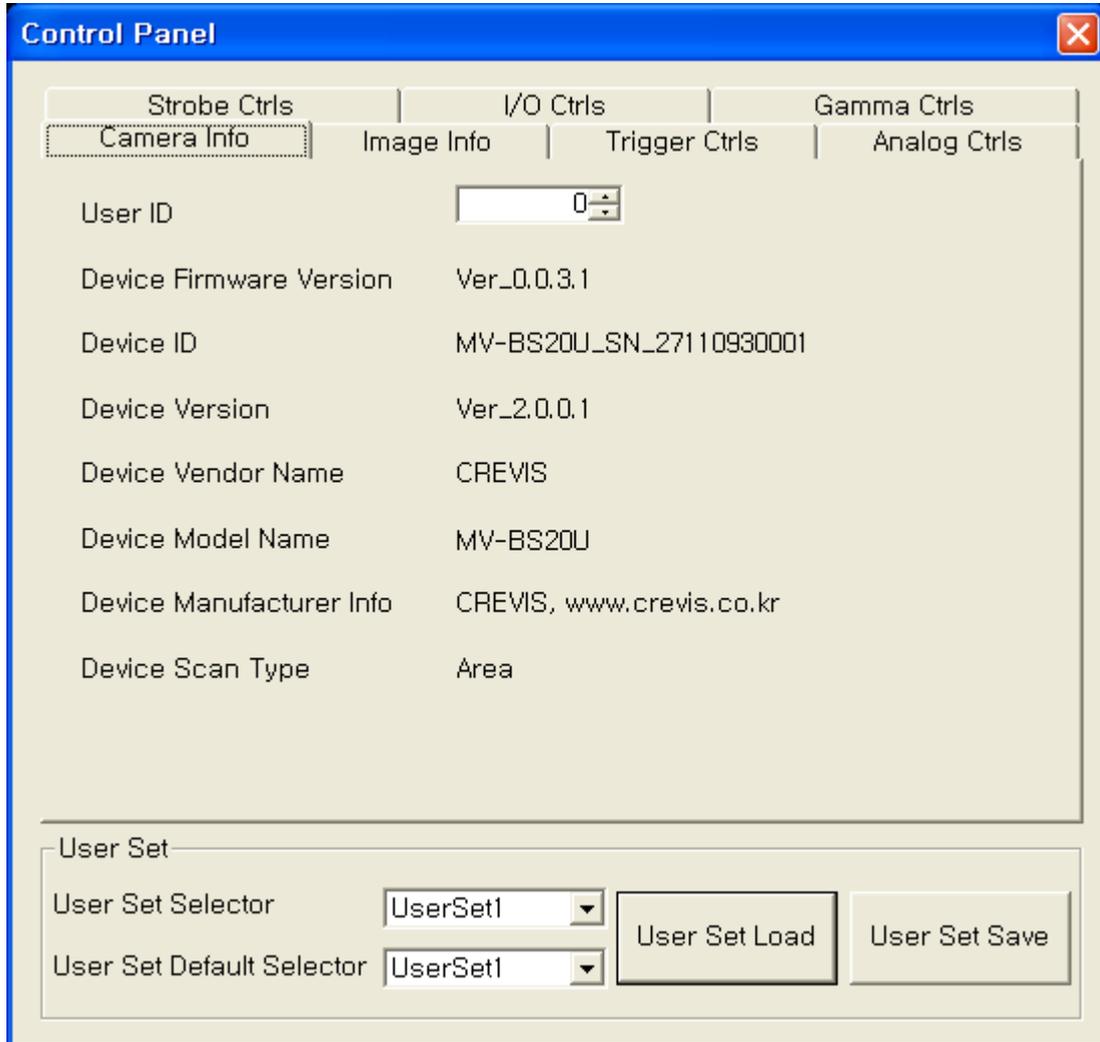| MV-BS20U (SN_271108A0001)	X: 250, Y: 1, Level:0	1280 X 1024 (Mono8)	Frame Count: 0, Lost Image : 0	FPS: 0,00
①	②	③	④	⑤

①   Model name (Serial No.)

②   Current location of Point, and Value of the point.

③   Resolution (Pixel Format)

         Pixel Format : Mono8(8bit) , Mono10(10bit, only monochrome), BayerBG8, RGB8Packed

④   Counter : Frame Count & Lost Image Count

⑤   Frame Rates per Second

2.2 Control Panel

2.2.1 Camera Info

- User ID : 0 ~ 65535
- Device Firmware Version : Camera firmware version
- Device ID : Model name and serial no.
- Device version : Current Library Version
- Device Vendor Name : Crevis
- Device Model Name : Camera model name
- Device Manufacturer Info : Manufacturer and its URL
- Device Scan Type : Area camera

2.2.2 Image Info

Control Panel

Strobe Ctrls | I/O Ctrls | Gamma Ctrls
Camera Info | Image Info | Trigger Ctrls | Analog Ctrls

Width Max	1280
Height Max	1024

Width ——————————————[1280]
Height ——————————————[1024]
Offset X [—————————————— [0]
Offset Y [—————————————— [0]

Binning Horizontal [Off ▼]
Binning Vertical [Off ▼]
Pixel Format [Mono8 ▼]
TestImage Selector [Off ▼]
Hrs Mode [Full ▼]

User Set

User Set Selector [UserSet1 ▼]   [User Set Load]   [User Set Save]
User Set Default Selector [UserSet1 ▼]

- Width
- Height

| Mode	MV-Sx Series	MV-Xx Series	MV-Vx Series
Binning	512	384	240
Partial1	512	384	240
Partial2	256(Binning+Partial1)	256	180
Partial3	128(Binning+Partial2)	196(Binning+Partial1,2)	120(Binning+Partial1,2)

※ Partial mode do not support setting in demo program

- OffsetX, Y : Setting "start position" of image output(Device Firmware Version Ver_0.0.1.0 more)
- Binning Horizontal : By "Binning Horizontal" two pixels neighboring horizontally, the sensitivity is twice brighter than the normal mode, however the frame rate isn't changed.
  ☞ notice : Color models are not supported.
- Binning Vertical : By "Binning Vertical" two pixels neighboring vertically, and frame rate and sensitivity goes up twice.
  ☞ notice : According to table, it is recommended to change Height size to get a normal image.
  ☞ notice : Color models are not supported.
- Pixel Format : Determine Data transfer bit
  Monochrome models : Mono 8 = 8Bit, Mono 10 = 10Bit

☞ notice : After User Set Save, and power should be rebooted.
   Color models : Mono8, BayerBG8, RGB8Packed

2.2.3 Trigger Ctrls
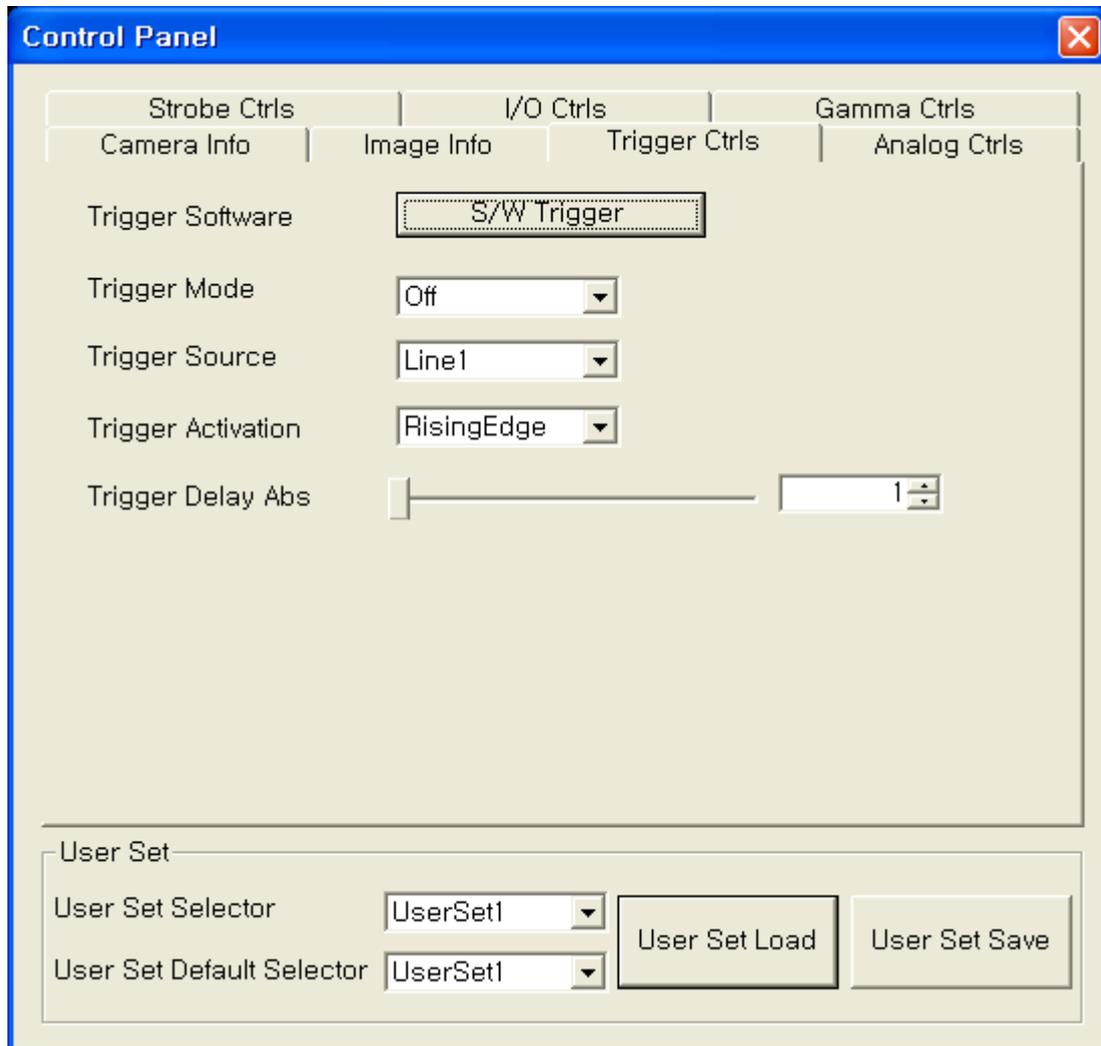
- Trigger Software : Send Software trigger command.
- Trigger Mode : Trigger mode(On), Normal mode(Off)
  ☞ notice : When Trigger mode is ON, it requires external trigger signal.
- Trigger Source : In Line1, output the image by external signal.

    In Software. [S/W Trigger] Press this button.

    In Transfer_End, output the image by internal signal in camera.

    In this case, the frame rates depends on exposure time.
- Trigger Activation : determine the mode of Trigger signal.
  In case of LevelLow and LevelHigh, determine the "exposure mode" in Pulse Width mode
- Trigger Delay Abs : After Delay from Trigger signal, Exposure starts.

2.2.4 Analog Ctrls
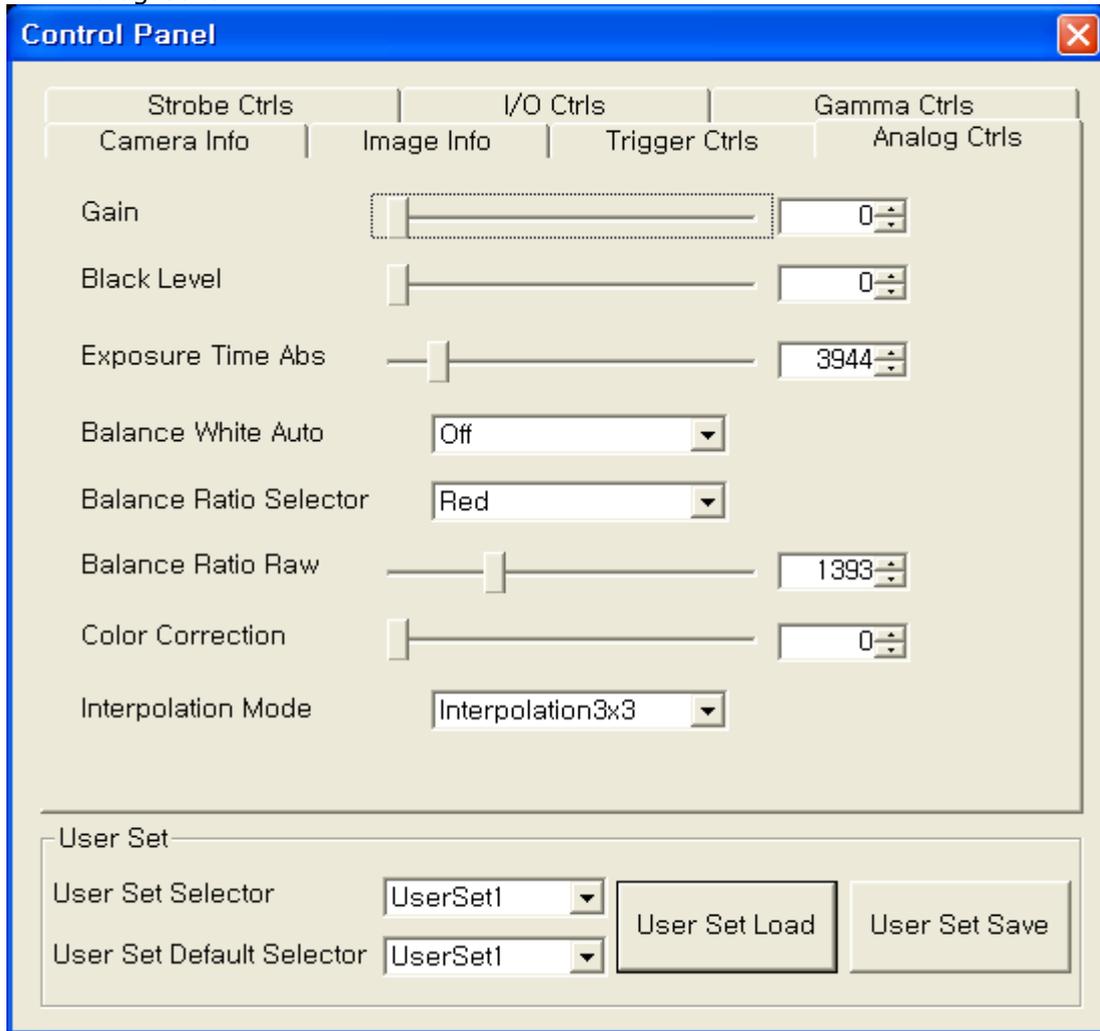
- Gain : 0 ~ 100(0dB ~ 24dB) adjustable.
- Black Level : 0 ~ 255 adjustable
- Exposure Time Abs : 66.9ms(SXGA), 35.2ms(XGA), 14.3ms(VGA) . [unit : us]
    If "TriggerMode" is ON, Exposure time is possible up to 130ms.
- Balance White Auto :
    Off :To adjust manually white balance, select the Off mode. It is able to increase or decrease the red
      or blue value by the slider bar of Balance Ratio Raw until the best color is obtained.
    Once : The Once mode is automatically adjusted to once white balance in a specific environment,
      and then return the Off mode. In order to obtain the best result, select the Once menu while the
      camera focuses on white paper.
    Continuous : The Continuous mode is automatically adjusted to continuous white balance in a specific
      environment.
- Balance Ratio Selector : To adjust Red-gain or Blue-gain, select the Red or Blue.
- Balance Ratio Raw : Increase or decrease the red-gain or blue-gain value by the slider bar.
- Color Correction : Compensate the result of white balance for Spectral Sensitivity Characteristics.
- Interpolation Mode : You can select one of color interpolation methods. The Interpolation mode is done
    on the PC. If larger filter mask is selected to get a higher image quality, the computational load will be
   increased accordingly.

2.2.5 Strobe Ctrls
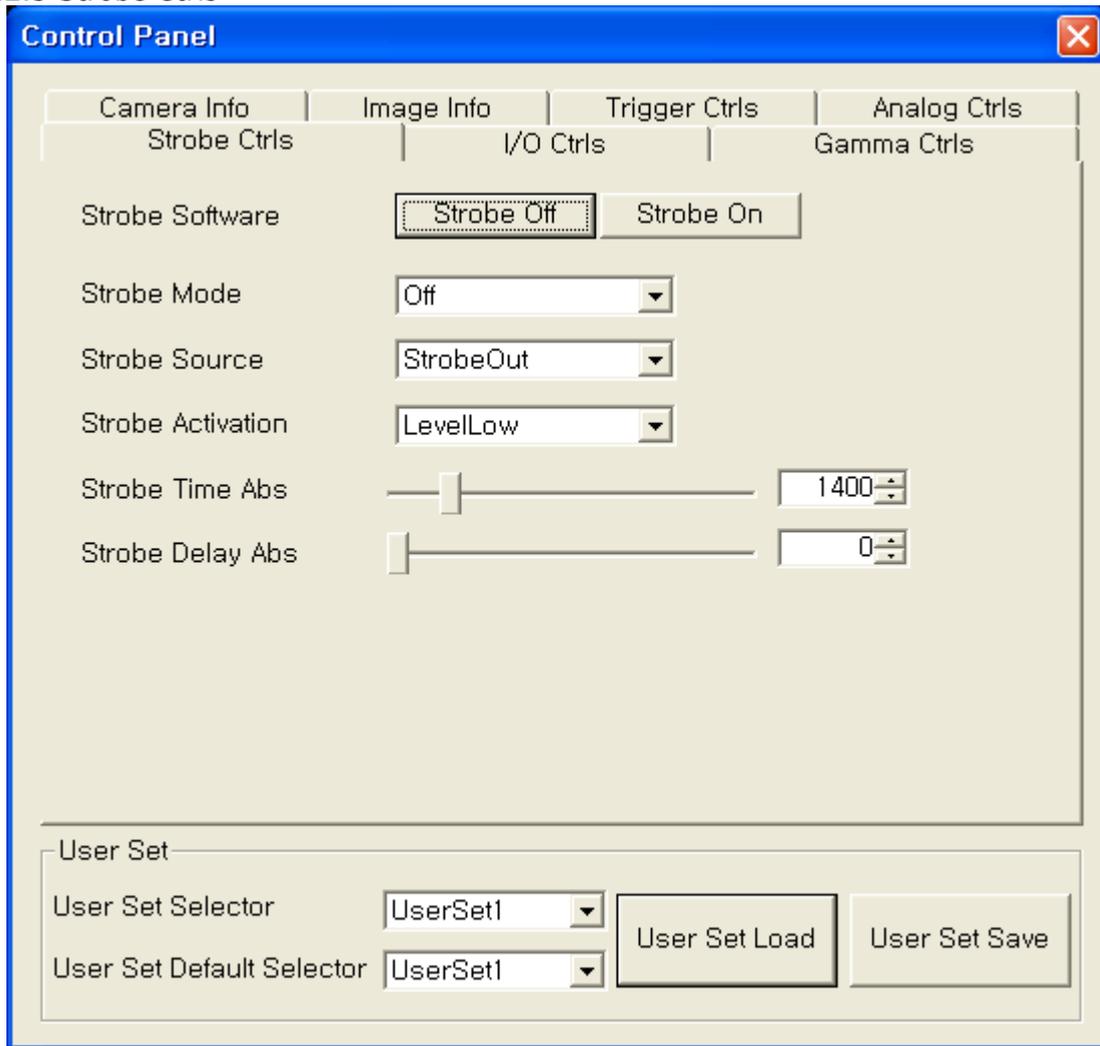
- Strobe Software : In Strobe Mode, setting 'Strobe Software' and select Output as high or low.
  ☞ notice : As Open collector output, External signal should be carefully considered.
- Strobe Mode : Off, Timed, Exposure
  In case of Timed, It is synchronized with internal trigger rising.
  In case of Exposure, It is synchronized with internal exposure rising.
- Strobe Time Abs : Duty is set by Strobe Activation [unit: us]
  The width of output is adjustable up to 9.1ms.
- Strobe Delay Abs : Applied delay from the signal of Strobe Mode. (Max 9.1ms)

2.2.6 I/O Ctrls

- ● Line Selector : Line2, Line3
- ● Line Mode : Input, Output
- ● Line Status : Read only
- ● Line Status All : Read only
- ● Line Source : UserOutput0, UserOutput1
- ● Line Source Selector : UserOutput0, UserOutput1
- ● User Output Value : Boolean '0' or '1'
- ● User Output Value All : 0 ~ 2
- ● Iris reference : range of 0 ~ 255. DC iris function is applied only in board type camera.
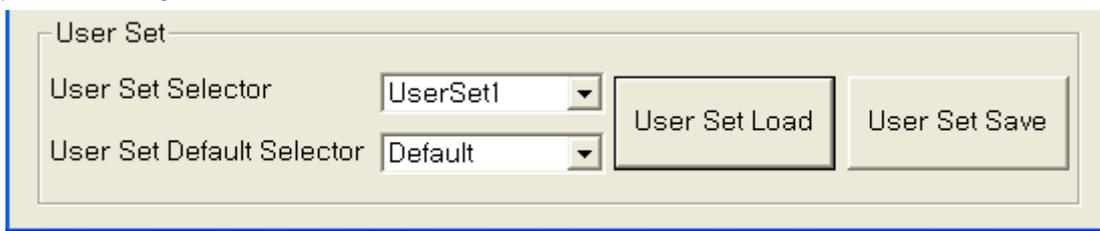
2.2.7 Gamma Ctrls
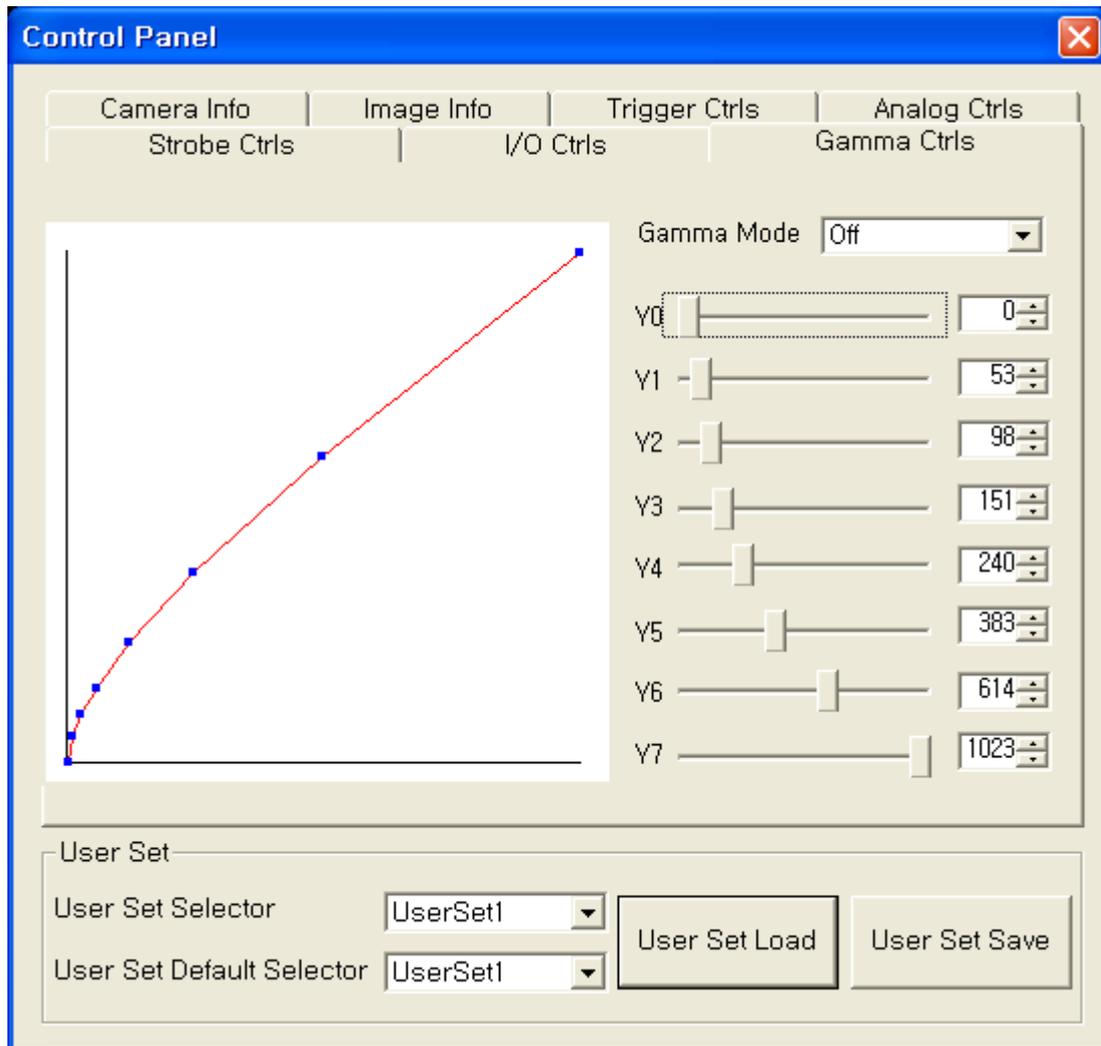
● Gamma Mode : Off(1), 0.45, 0.70, Table

2.2.8 User Set

● User Set selector : UserSet1

● User Set Default Selector : UserSet1, Default

● Using [User Set Save] , it can be saved in EEPROM in the camera.

● From [User Set Load] , it allows to read the value of EEPROM.

[Example of Setting]

Pressing [User Set Save] with "Default" in "User Set Default Selector" , Values of EEPROM in the camera

are changed to Default.
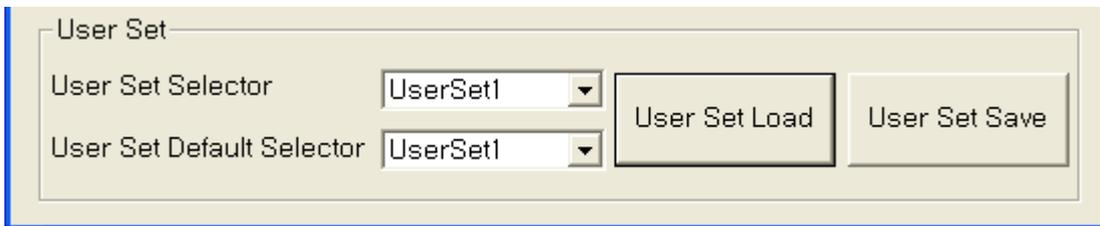
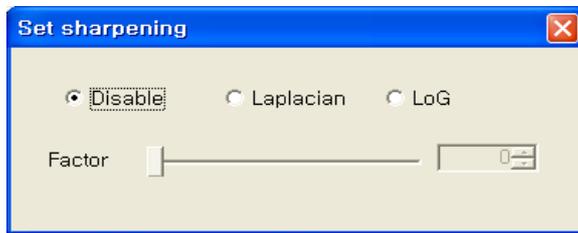Pressing [User Set Load] , values of EEPROM in the camera can be read.

Pressing [User Set Save] with "UserSet1" of "User Set Default Selector" , changed values in PC are saved

to EEPROM in the camera.

2.3 Processing

2.3.1 Sharpening

- Disable : Image not processed.
- Laplaciab : Image processed by Laplacian mask.
- LoG : Image processed by Laplacian of a Gaussian mask.
- Factor : Strength of sharpen.

3. Functions

3.1 Normal mode

In case that trigger mode is off as follows figure, the camera is to be normal mode.

TriggerMode Off ▼

In Normal mode, the camera internally exposes one image after another with set "frame rate".
Exposure and readout/transfer of the image are done simultaneously. Therefore the maximum frame rates can be achieved in normal mode. The maximum exposure time depends on readout/transfer, so that it can be happened flicker.

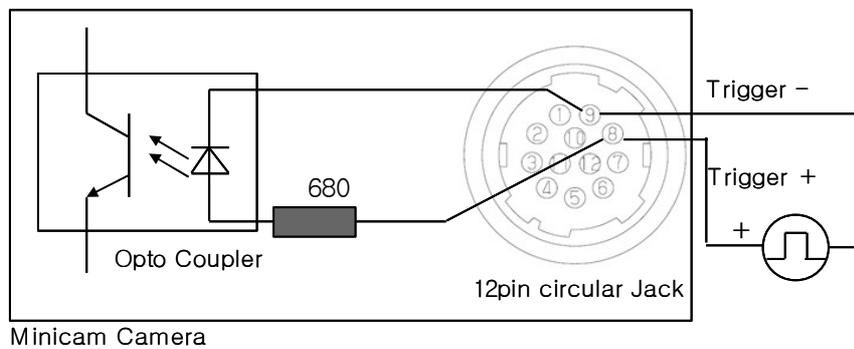| Exposure	Readout		
	Exposure	Readout	
		Exposure	Readout
			Exposure	Readout

Time
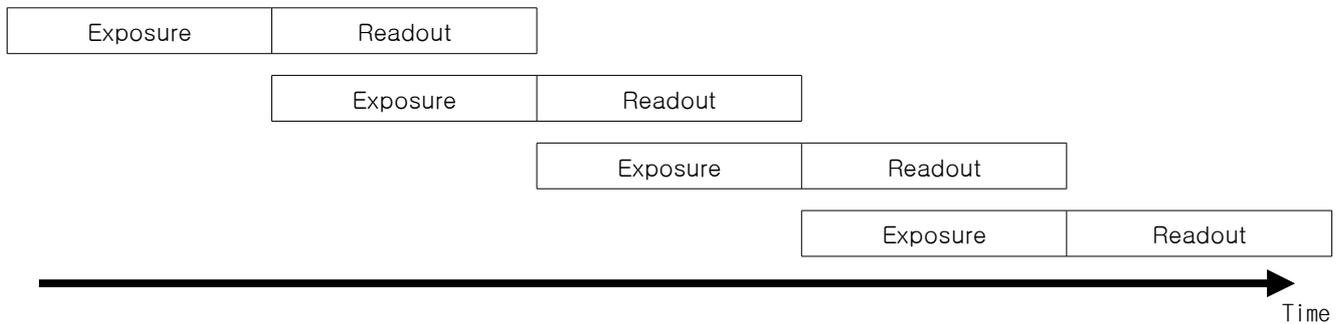
3.2 Trigger mode

In trigger mode, the camera is in a wait state and exposed one image immediately after the occurrence of a trigger event. As follows figure, trigger, delay, exposure and readout/transfer of the image are done successively. If another trigger is input during the process of trigger and exposure time, It is ignored. The frame rate depends on the delay time and exposure time. The frame rates of "minimum delay and exposure time" is approximate with that of normal mode.

Selecting Overlap function, however, Another trigger becomes valid. Setting the period of trigger in "ReadOut" should be careful not to be overlapped.

Trigger signal input → Delay → Exposure → Readout (USB) → Post processing (PC)
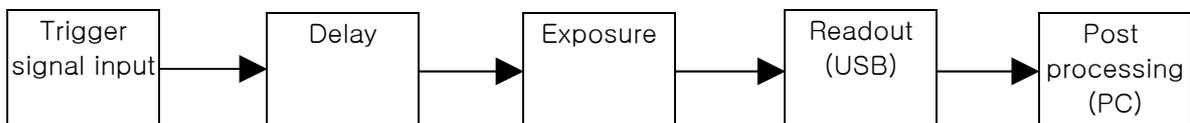
- Trigger input hardware specifications

Contents	Min	Max	Ref
Trigger Level Low	0	2	V
Trigger Level High	5	24	V
Trigger Level Voltage Range	0	30	V
Trigger Pulse Width(edge active)	100	∞	usec
Falltime	35		V/ms
Isolation Voltage	50		V


```
┌──────────────────────────────────────┐
│                          Trigger −     │
│   Opto Coupler   680                   │
│              12pin circular Jack       │
│   Minicam Camera         Trigger +     │
└──────────────────────────────────────┘
```

☞ **Warning**

"Input current" of External trigger has not to exceed "10mA".

3.2.1 Trigger rising edge

Setting of camera is as follows figure. In case that Trigger Source is Line1, input external trigger signal into camera.

Trigger Mode	On
Trigger Source	Line1
Trigger Activation	RisingEdge

Shown as below drawings, after delay, exposure, and readout in a rising edge of external trigger signal, image is transferred to PC.
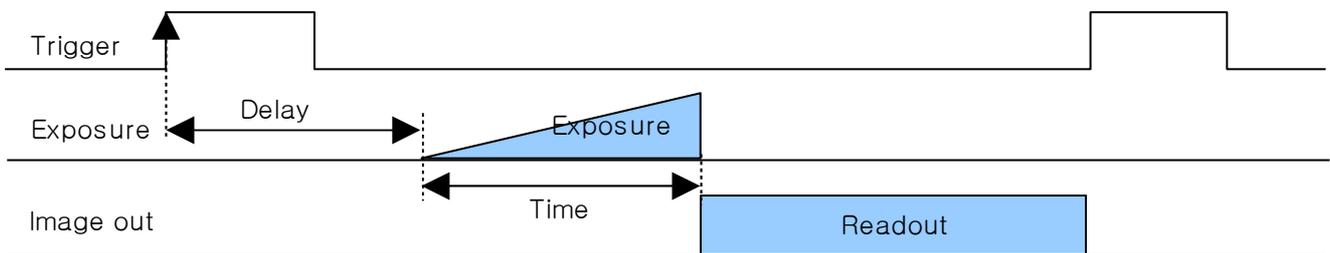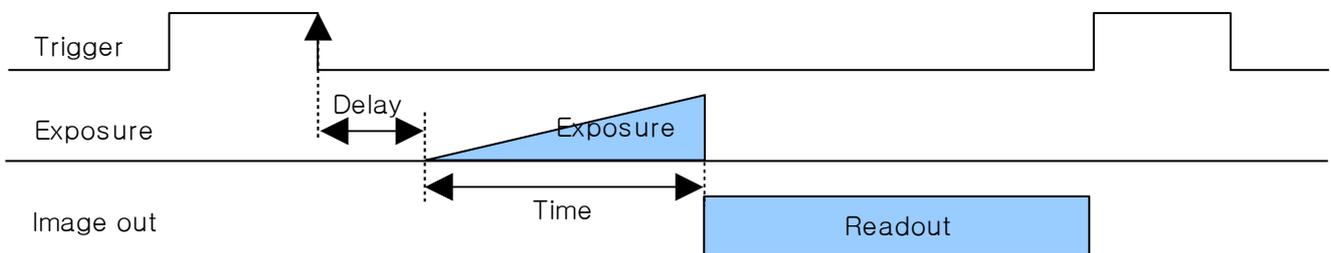

3.2.2 Trigger falling edge

Setting of camera is as follows figure.

Trigger Mode	On
Trigger Source	Line1
Trigger Activation	FallingEdge

Shown as below drawings, after delay, exposure, and readout in a falling edge of external trigger signal, image is transferred to PC.

Notice : A software of trigger source should be used between rising and falling edge of trigger activation.

Trigger Source	Line1
	Line1
	Software

3.2.3 Trigger Level High

Setting of camera is as follows figure.

Trigger Mode	On
Trigger Source	Line1
Trigger Activation	LevelHigh

Shown as below drawings, exposure is proceeded in trigger high pulse width and then in sequence of delay, exposure,and readout image is transferred to PC
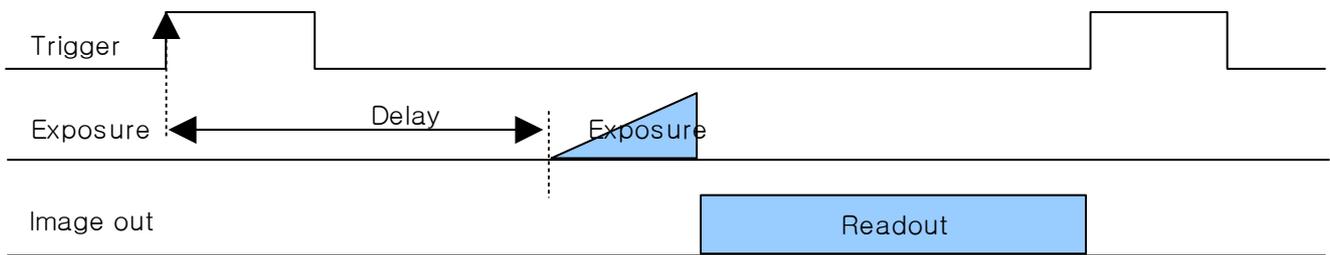
3.2.4 Trigger Level Low

Setting of camera is as follows figure.

Trigger Mode	On
Trigger Source	Line1
Trigger Activation	LevelLow

Shown as below drawings, exposure is proceeded in trigger high pulse width and then in sequence of delay, exposure,and readout image is transferred to PC.
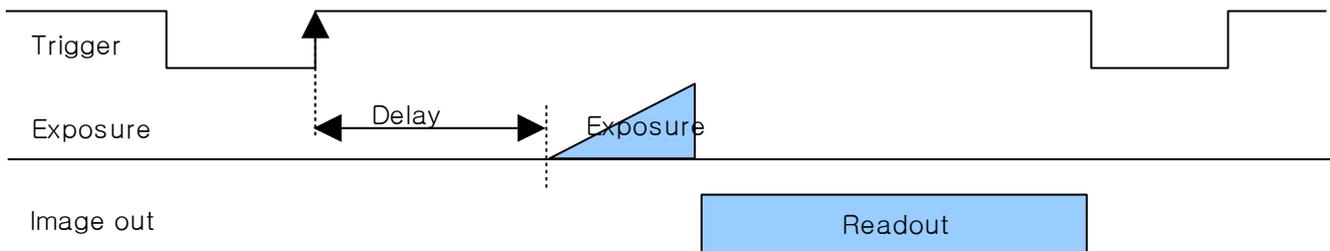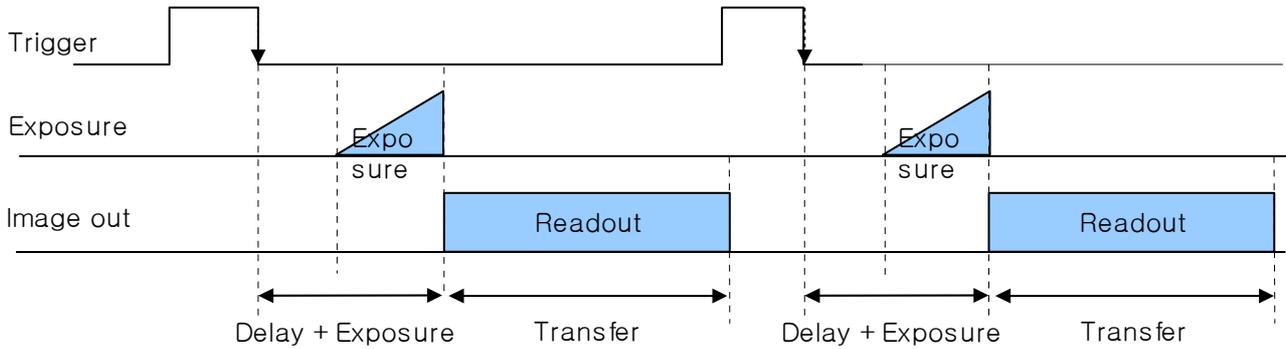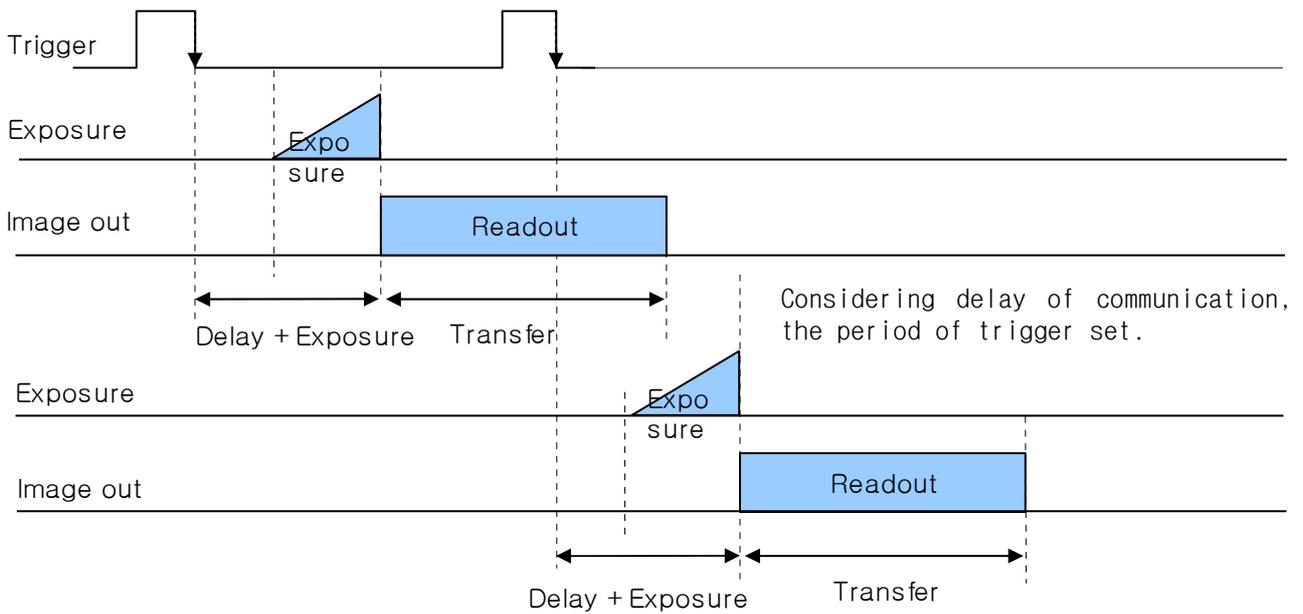
3.2.5 Overlap mode

This applies when Trigger mode is On. According to setting of Trigger delay and Exposure , falling of Frame rate is possible to be compensated. Readout, however, should be not overlapped otherwise image is broken.

- Overlap OFF (Trigger falling edge)

- Overlap On(Trigger falling edge)

Considering delay of communication, the period of trigger set.

3.3 Strobe mode

The strobe output can be set statically by software or depending on the trigger and exposure time.

The output signal consists of an opto-coupler circuit as follows figure.

The output of the opto-coupler can be used as open collector. Don't connect AC voltages.
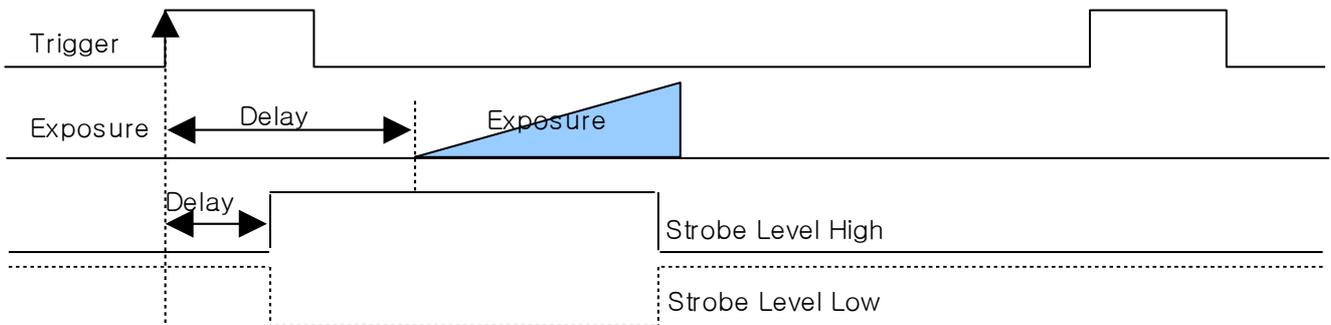
Load Current	500mA
Load Voltage	30V
Isolation Voltage	50V
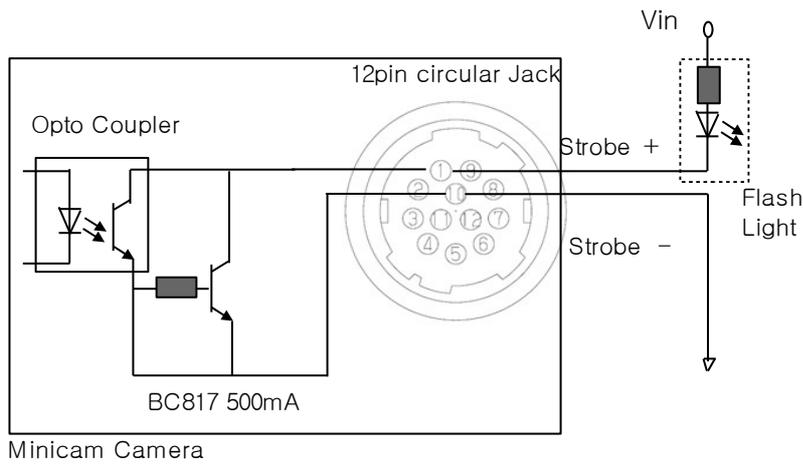
Shown as below figures which is set to Timed, a strobe signal is generated at the point of trigger rising edge.


Prior to exposure time, a strobe / flash is possible to be generated

When ExposureWidth is set as shown as below figure, a strobe signal is generated at the point of internal exposure rising edge. In case of needs for strobe in a normal mode, StrobeMode should be identified with ExposureWith.

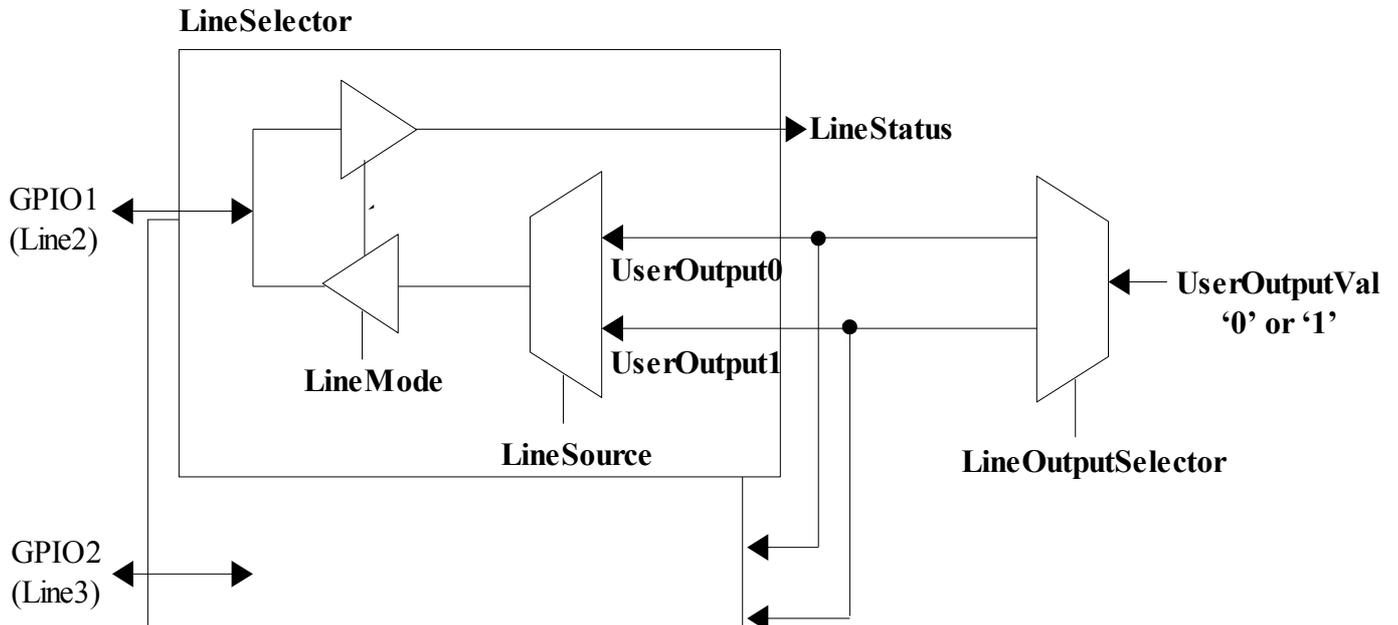|	
Strobe Mode	ExposureWidth
Strobe Source	StrobeOut
Strobe Activation	LevelLow
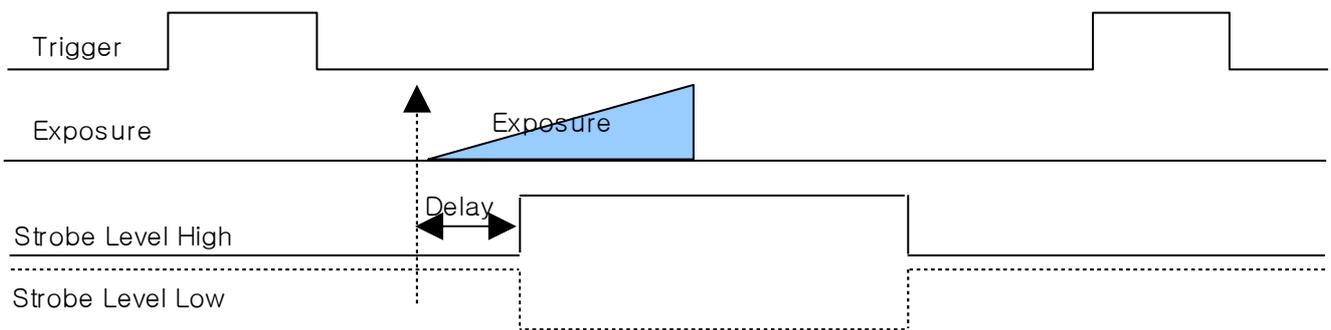
☞ **Caution**

"Strobe output" is Open collector so that peripheral hardware should be considered to match with demo program.

3.3 GPIO Function

Board Type camera have 2 ports(TTL) of general purpose I/Os.

The following example is pseudo-code for using GPIO:

ex1) In case of using Line2 to Input
```
LineSelector = Line2;
LineMode = Input;
CurrentStatus = LineStatus;
```
ex2) In case of using Line2 and Line3 to Output (Line2<=>UserOutput0, Line3<=>UserOutput1)
```
// Line2 configuration
LineSelector = Line2;
LineMode = Output;
LineSource = UserOutput0;
// Set Line2 output to low level
UserOutputSelector = UserOutput0;
UserOutputValue = 0
// Line3 configuration
LineSelector = Line3;
LineMode = Output;
LineSource = UserOutput1;
// Set Line3 output to low high
UserOutputSelector = UserOutput1;
UserOutputValue = 1;
```
ex3) In case of using UserOutputValueAll
```
// Line2 configuration
LineSelector = Line2;
LineMode = Output;
LineSource = UserOutput0;
// Line3 configuration
LineSelector = Line3;
LineMode = Output;
LineSource = UserOutput1;
//Set Line2 output to low level and Line3 output to low high
UserOutputValueAll = 0x0002;
```

4. Troubleshooting

Circumstances	Troubleshooting
Can not "Open" camera	Please check the connection between camera and PC.
Fail to find USB device driver	1. Check the USB cable's connection 2. Check USB driver is properly installed 3. Reboot the computer and try again. If you fail again, remove the driver and try again the installation.
The following error message (Window XP message): "HI-SPEED USB device is plugged in non-HI-SPEED USB hub"	The system operate USB1.1 mode like this case. 1. Make sure that USB2.0 function is ON 2. Download and install Microsoft USB patches.(KB822603) 3. On [Control Panel] → Select Start → System → Device Manager → [Universal Serial Bus controllers] lists select the property of USB 2.0 root hub and select the Power Management tab. Uncheck the 'To turn off this device for saving Power item'. 4. Turn off the power management(S3) of computer.
This PC is loaded with USB 2.0 controller but it's image frame rate is far inferior.	1. USB uses CPU's resource to send data. In the event that the program with low CPU spec. of PC or exhaust significant system resource in the background is operated with camera at the same time, capacity's decline may occur. We recommend to use Crevis program only, if possible. 2. In the event of PC that used the DVMT (Dynamic Video Memory Technology) type of built-in graphic card, the graphic processing capability has the limit to have the capability decline and screen dryness. Check the safety mode of the option dialog and use. 3. In the event that the user PC recognized as the USB1.1 mode, such a phenomenon may occur. After having the error on the above for, "HI-SPEED USB equipment is inserted on the non-HI-SPEED hub" error , it operates with the USB 1.1 mode that the image frame rate declines. Remove the USB cable that connects PC and link again, then it normally recognized as the USB 2.0 mode.
No displaying image after Camera Open	Check Trigger signal's connection. → make sure that trigger mode is proper in Control Panel.
No displaying image after Camera Open. Only The FPS(Frame rate) of status bar is increased.	If ATI graphics is used on your PC, please update graphic driver with latest version.
The image of the actual condition which flickers occurs at freerun mode.	In case of using the low CPU spec of PC. Please use the Software trigger mode.
If you have experience for framerate decrease or noise increase problem, When use Interpolation5x5	If framerate decrease or noise increase are occurred when use the Trigger off mode and Interpolation5x5 mode, we recommand to use Interpolation3x3 Interpolation5x5 spend many cpu source so if you use a lower level pc, problem is occurred