



# **SDK-AcapLib2 Viewer Manual**

## Table Contents

<b>Table Contents</b> .....	<b>2</b>
<b>Chapter 1. Before Start Using</b> .....	<b>3</b>
<b>Chapter 2. Starting Software</b> .....	<b>4</b>
<b>Chapter 3. About Each Menu</b> .....	<b>6</b>
<b>3-1. File</b> .....	<b>6</b>
<b>3-2. Initialize</b> .....	<b>8</b>
<b>3-2-1. Common / Size Tab</b> .....	<b>9</b>
<b>3-2-2. Tap / Arrangement Tab</b> .....	<b>13</b>
<b>3-2-3. Input Mode Tab</b> .....	<b>15</b>
<b>3-2-4. Shutter / Strobe Tab</b> .....	<b>17</b>
<b>3-2-5. ExtTrig / GPOUT Tab</b> .....	<b>19</b>
<b>3-2-6. Encoder Tab</b> .....	<b>21</b>
<b>3-2-7. Record</b> .....	<b>22</b>
<b>3-3. Input</b> .....	<b>23</b>
<b>3-4. View</b> .....	<b>24</b>
<b>3-5. Help</b> .....	<b>26</b>
<b>3-6. Window Title</b> .....	<b>26</b>
<b>3-7. Status Bar</b> .....	<b>27</b>
<b>3-8. Main Window</b> .....	<b>27</b>
<b>Chapter 4. Tool Bar</b> .....	<b>28</b>
<b>Chapter 5. Revision History</b> .....	<b>29</b>
<b>Chapter 6. Support Offices</b> .....	<b>31</b>

## **Chapter 1. Before Start Using**

This book is the manual about AcapLib2Viewer.

The followings main functions of AcapLib2Viewer are written in this book.

- Initialize
  - Size / Delay for grabbing
  - External trigger
  - Random shutter
  - Encoder
- Save/Load file
  - Save : bmp、 csv、 bin、 jpg、 gif、 tif、 png
  - Load : bmp、 bin
- Input images
  - Snap (One shot snap)
  - AutoSnap (Continuous snap-shot)
  - Grab (Streaming)
- Save/Load ini file
- View
  - Zoom in / Zoom out / Original size
  - Brightness information view

**The company and product names used in this book are trademark or registered trademark of each company.**

## Chapter 2. Starting Software

Use execute file (AcapLib2Viewer.exe) in [SDK-AcapLib2]→[Sample]→[Viewer].

(Activate AcapLib2Viewer\_x64.exe when you use 64 bit OS)

The dialog for selecting ini file, board(= frame grabber) that you use, board number, and input channel appears.

\*



Figure 1. Dialog for checking board that used and others

Select board that you use (Figure 2-1), board number (Figure 2-2), and input channel (Figure 2-3).

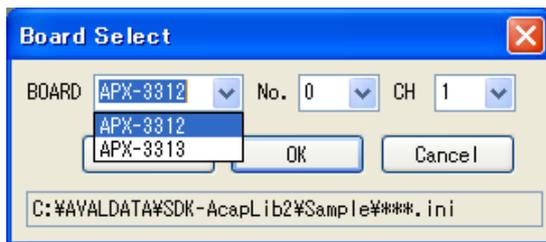


Figure 2-1. Select board

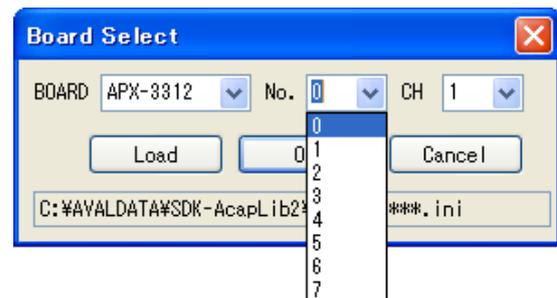


Figure 2-2. Select board number

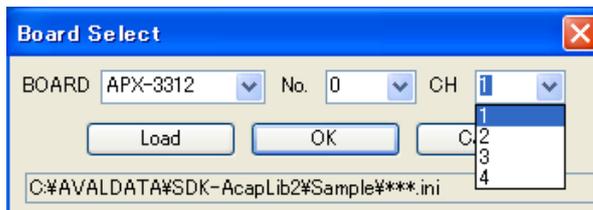


Figure 2-3. Select input channel

When you press [Load], it shows the dialog for selecting ini file.

When you press [OK] after selecting ini file, it is automatically initialized by values in ini file.

Even any ini file is not selected, it starts to initialize and activates application by pressing [OK].

At that time, the setting value changes by whether "ini file for activation" is existed at same class.

If "ini file for activation" exists, it activates with setting value in that ini file.

If "ini file for activation" does not exist, it activates after regular default value is set up.

(Refer to table on next page for correspondence between ini file and performance at activation)

The following shows the selection situation of ini file and performance at the time pressing [OK].

Load ini file	ini file for activation (*1)	Performance
Perform		Start software
Not perform	Exists	Initialize by ini file for activation
Not perform	Not exists	Initialize as default value (*2)

(\*1) The ini file for activation is loading if you had not chosen any specified file.

The file name is set as "Board[A]No[B]Ch[C].ini".

A → Board name

B → Board number

C → Input channel

If you use board "APX-3312", board number "3", and input channel "2", it creates "Board[APX-3312]No[3]Ch[2].ini" automatically after ending application.

The setting value at end of application is always overwritten at this file.

(\*2) The following shows default values.

Camera classification : Area sensor

Input size : 640 \* 480

X, Y delay : 0, 0

Camera input bit : 8bit

When you press [OK], following window is shown up if the initialization is success.

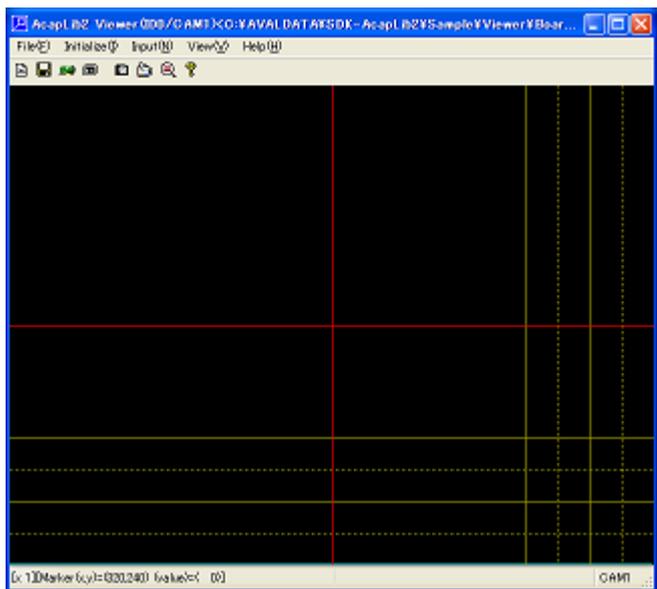


Figure 2-4. Main Window

## Chapter 3. About Each Menu

### 3-1. File

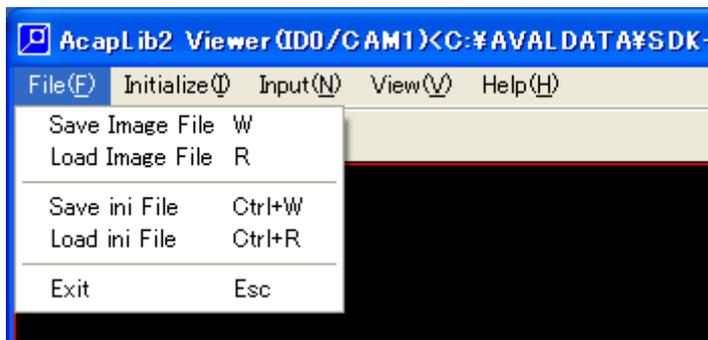


Figure 3-1-1. File menu

#### [Save Image File (W)]

Save displayed images in bmp, csv, bin, jpg, gif, tif, and png format.

You can perform same process by pressing “W” on viewing window.

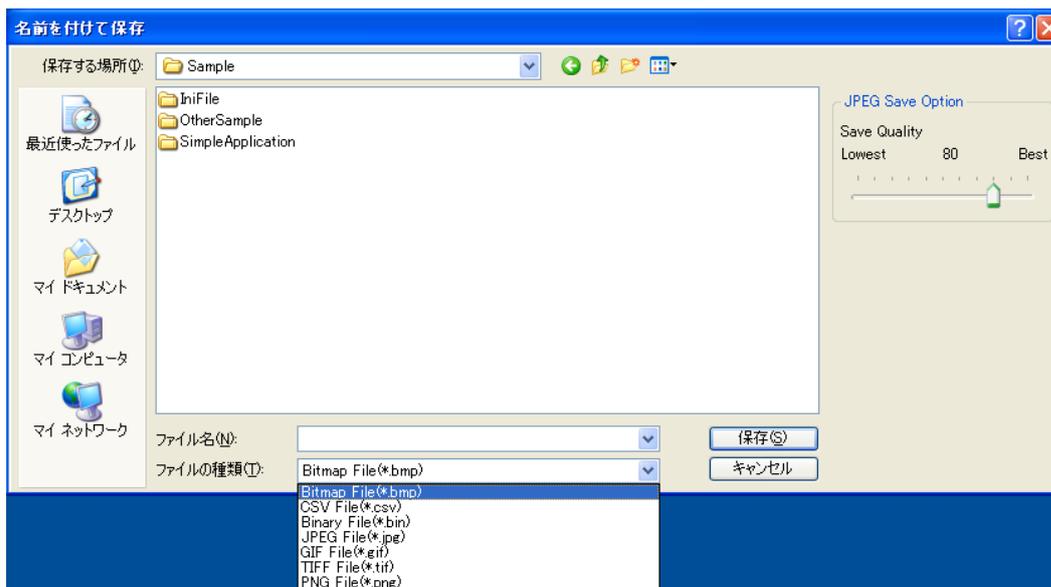


Figure 3-1-2. Save menu

\* When you save image by JPEG file

You can specify save quality at right side of dialog “Save as...”.

#### [Load Image File (R)]

Load chosen bmp image file, then display at view window.

It cannot load other formats.

You can perform same process by pressing [R] on viewing window.

#### [Save ini File (Ctrl+W)]



Save ini file you use.

You can perform same process by pressing [Ctrl+W] on viewing window.

[Load ini File (Ctrl+R)]

Reload ini file.

It also initializes board at same time.

You can perform same process by pressing [Ctrl+R] on viewing window.

[Exit (Esc)]

End this application.

You can perform same process by pressing [Esc] on viewing window.

### 3-2. Initialize

When you select “Initialize(I) - Board” at menu, the following dialog (Figure 3-2) appears.

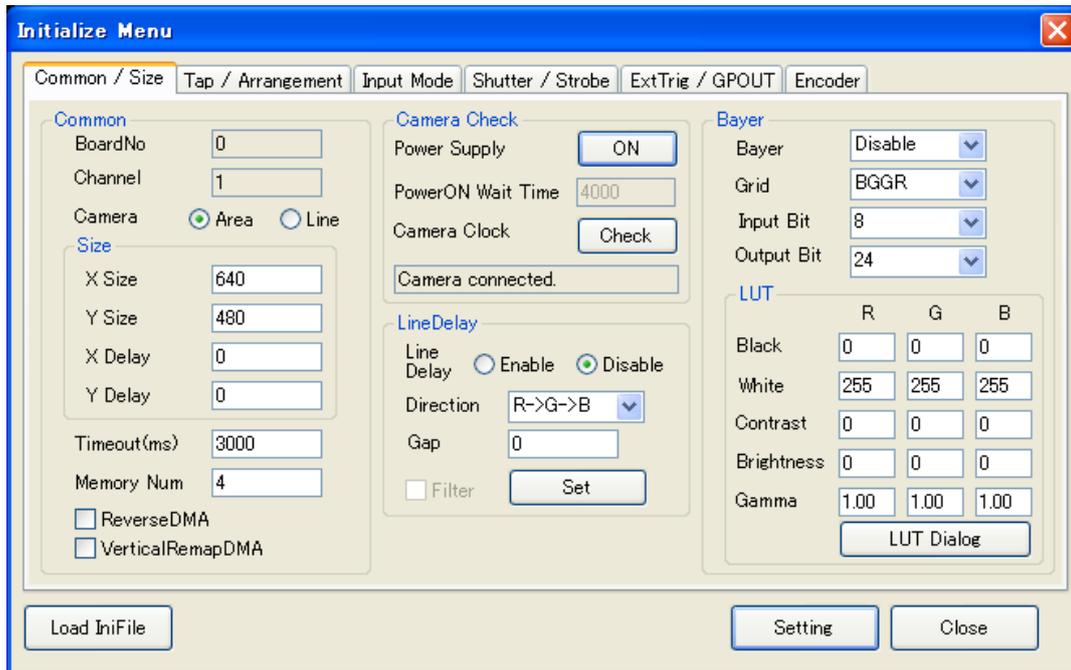


Figure 3-2. Initialization dialog

The initialize dialog is divided into 6 tabs.

- Common / Size  
Set up camera classification, input size, power supply management, line delay compensation, Bayer, and LUT.
- Tap / Arrangement  
Set up camera outputted bit, tap numbers, and method for rearrangement.
- Input Mode  
Set up the method of input.
- Shutter / Strobe  
Set up camera trigger (line trigger) and strobe.
- ExtTrig / GPOUT  
Set up external trigger and general output.
- Encoder  
Set up encoder.

The detail about setting of each tab is written from the next page.

### 3-2-1. Common / Size Tab

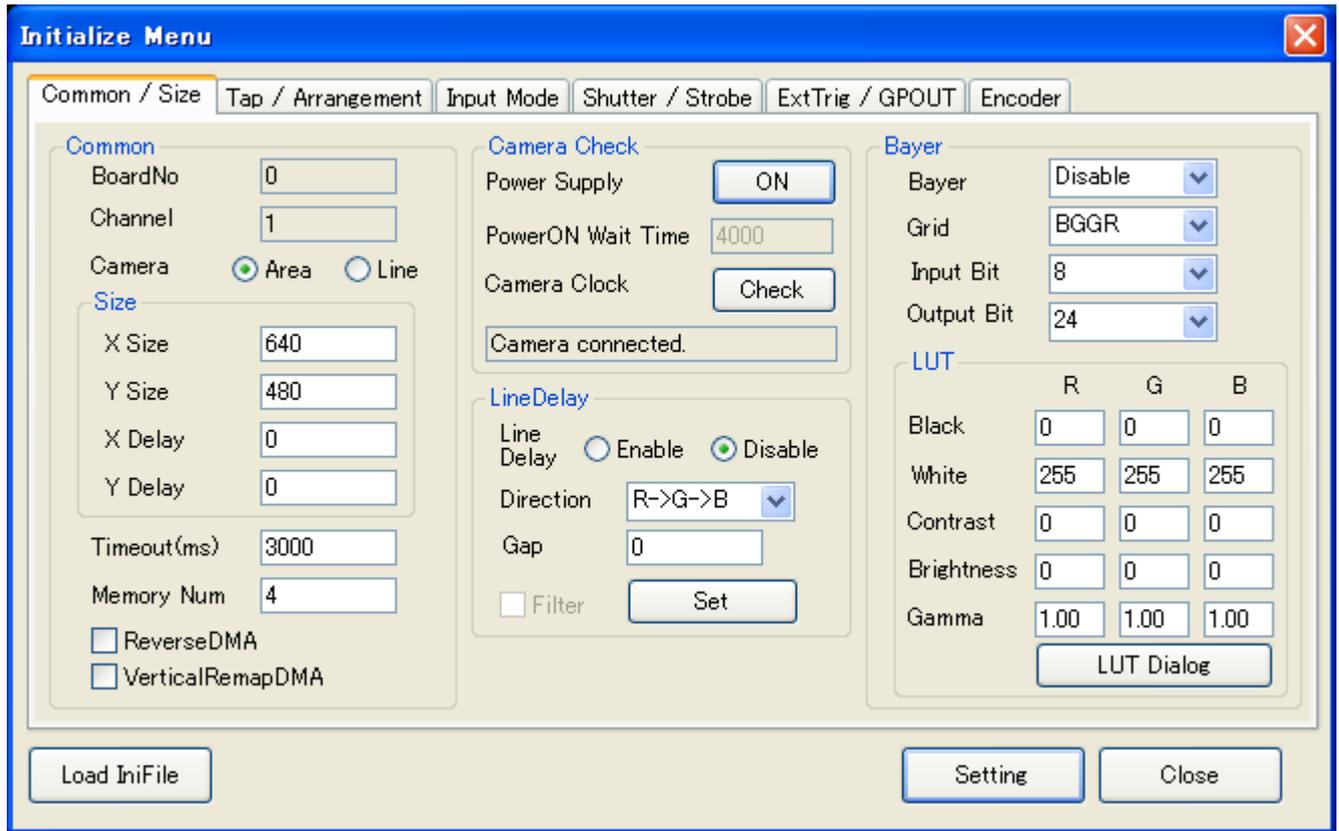


Figure 3-2-1-a. Common / Size Tab

<b>Common</b>	BoardNo	Fix as board number which is selected at the starting. Cannot change from default setting.	
	Channel	Fix as input channel which is selected at the starting. Cannot change from default setting.	
	Camera	Choose connected camera. Area → Area sensor Line → Line sensor	
	<b>Size</b> (*1)	XSize	Specify the capturing size of X direction. [Setting range] 8 ~ 65528
		YSize	Specify the capturing size of Y direction. [Setting range] 1 ~ 16777215
XDelay		Specify starting point of image input for X direction. [Setting range] 0 ~ 65535	
YDelay		Specify starting point of image input for Y direction. [Setting range] 0 ~ 1023	

	Timeout	Show the timeout until detecting external trigger. Specify this in “ms”. [Setting range] 1 ~ 4294967295
	Memory Num	Specify number of memory for securing inputting image. [Setting range] 1 ~
	ReverseDMA	Perform flip vertical DMA to taken image. Disable → Neutral (Not perform flip vertical DMA) Enable → Perform flip vertical DMA
	VerticalRemapDMA	Perform vertical mutual DMA of captured image. Disable → Neutral (not perform vertical mutual DMA) Enable → Perform vertical mutual DMA
Camera Check	Power Supply	<b>&lt;Frame grabber with power supply capability only&gt;</b> Control the ON/OFF of power supply.
	PowerON Wait Time	<b>&lt;APX-3311 only&gt;</b> Set waiting time until proper clock comes after power supply ON. Specify this in “ms”. [Setting range] 1 ~ 65535
	Camera Clock	Confirm whether there is any clock from camera. Not connected ⇒ The camera is unconnected or its power is off. PoCL Camera connected ⇒ PoCL camera is connected. PoCL-Lite Camera connected ⇒ PoCL-Lite camera is connected. Camera connected ⇒ Camera is in connected state.
Line Delay	This function makes images, inputted from digital color line sensor camera (three lines) without using optical process (prism), to proper color images by software operation. (Since observation points are different for every RGB, image becomes blurred without compensation.) The process may need long time in case of PC environment and capturing size.	
	LineDelay	Specify whether performs line delay compensation. Perform process on the basis of G line. The blank (black), which is big as specified Gap, is added at upper and lower of image after the process,
	Direction	Specify attaching direction of sensor (for process).
	Gap	Specify the line number between sensors. Specify this by camera you use.
	Filter	The setting that performs filtering of {1, 2, 1}, which reduce scatters in Odd/Even pixel.
	Set	Initialize compensation of line delay at every time pressing button. It affects to images even in process that capturing image.

<b>Bayer</b>	<p>The function that shows color display of the camera of RAW-data output by software or hardware conversion.</p> <p>[Software Conversion]</p> <p>The process may need long time in case of PC environment and capturing size.</p>	
	Bayer	<p>Set whether to perform software or hardware Bayer conversion</p> <p>Disable → disable conversion</p> <p>Software → software conversion</p> <p>Hardware → hardware conversion</p> <p><b>The connected camera must be RAW-data output.</b></p>
	Grid	<p>Select Bayer arrangement of top 2x2.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>BGGR</p> </div> <div style="text-align: center;">  <p>RGGB</p> </div> <div style="text-align: center;">  <p>GBRG</p> </div> <div style="text-align: center;">  <p>GRBG</p> </div> </div>
	Input Bit	<p>Bit width which performs Bayer conversion.</p> <p>[Setting value] 8/10/12</p>
	Output Bit	<p>Bit width after the Bayer conversion.</p> <p>[Setting value] 24/30/32</p>
	LUT Dialog (*2)	<p>Shows the setting window which set up look up table (LUT) for each RGB.</p>
	Black	<p>Adjust black points (starting point of luminance value conversion chart).</p> <p>[Setting range] 0 ~ Input bit width</p>
	White	<p>Adjust white points (ending point of luminance value conversion chart).</p> <p>[Setting range] 0 ~ Input bit width</p>
	Contrast	<p>Adjust contrast (gradient of luminance value conversion chart).</p> <p>[Setting range] -100 ~ 100</p>
	Brightness	<p>Adjust brightness (offset of luminance value conversion chart).</p> <p>[Setting range] -128 ~ 128</p>
	Gamma	<p>Perform gamma control to luminance value.</p> <p>(Example)At 8 bit image data, if value before compensation is src, after compensation is dst, and gamma control is γ,</p> $dst = \sqrt[\gamma]{\frac{src}{255}} * 255$ <p>[Setting range] 0.01 ~ 5.00</p>

(\*1)

The limiting value of size depends on board you use. Refer to “Library Manual” for more information.

The limit of X size at the time of selecting rearrangement is depending on FPGA version of APX-3312.

First, select [Help]-[Version] and check FPGA version of APX-3312 that you are using.

If you use FPGA version “2”, the limit of X size is “multiple of 256”.

If you use FPGA version “3”, the limit of X size is “multiple of 16”.

If you use APX-3312 that FPGA version is “2”, you can change version to “3” or later by rewrite FPGA data.

(\*2)

The following setting screen appears when you press [LUT Dialog].

Luminance value conversion chart at right side is updated when you directly edit values on display or change it by scrolling.

Also when you change setting of RGB separately, select color chosen by check in [Color] and adjust it.

You can click to the [Reset] button to return to the initial of settings.

When you finish all set up, by pressing [Setting], this dialog is closed and setting values are reflected in screen of initialization.

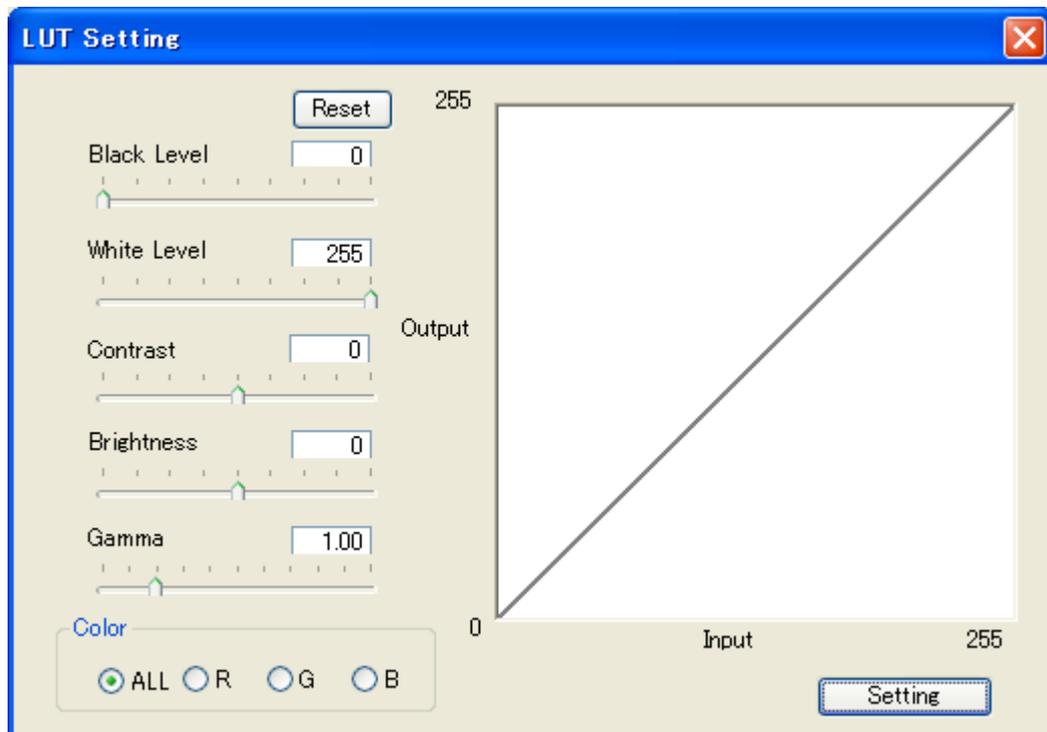


Figure 3-2-1-b. LUT setting screen

### 3-2-2. Tap / Arrangement Tab

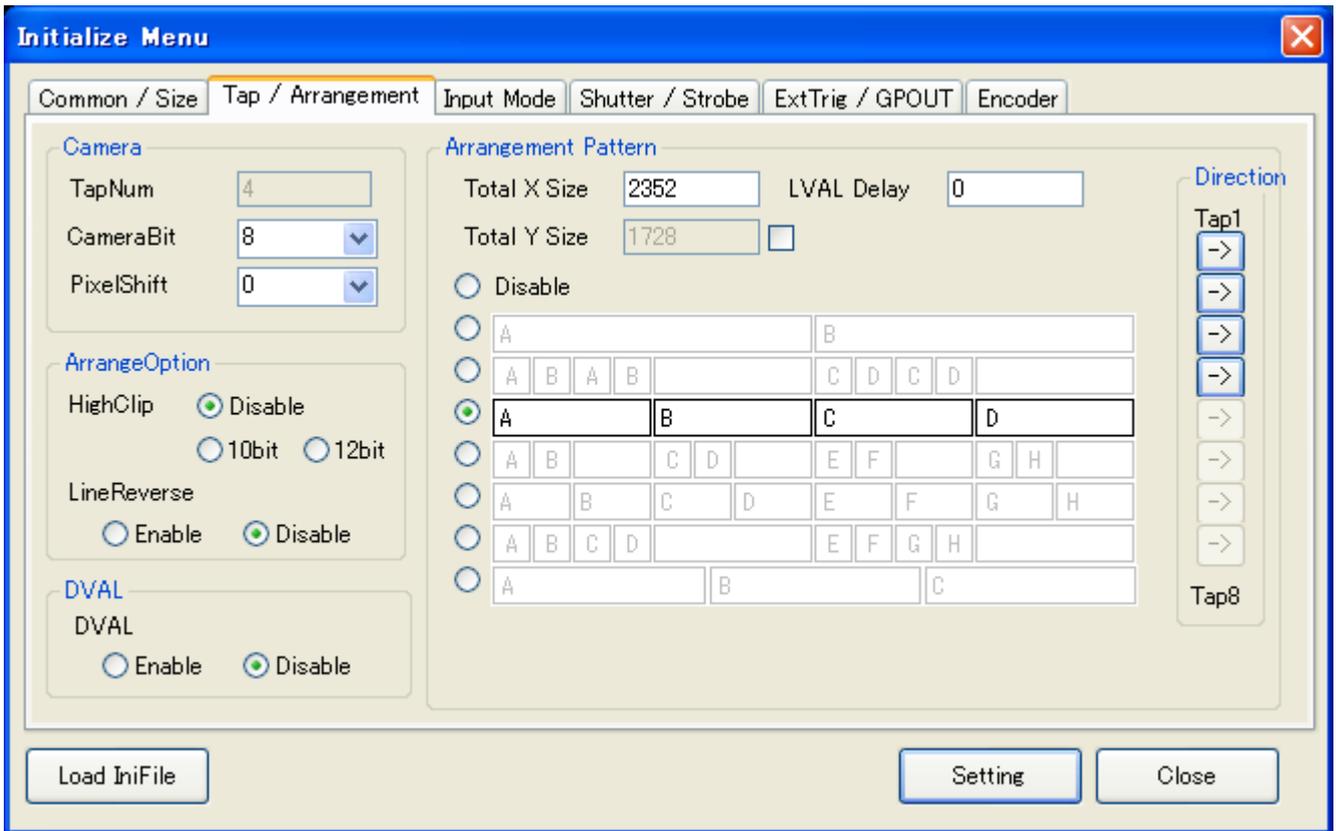
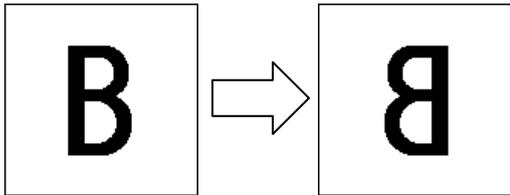


Figure 3-2-2. Camera / Tap / Arrangement Tab

<b>Camera</b>	TapNum	Output tap number of connected camera. [Setting range] 1 / 2 / 4 / 8 / 10 <b>You can use "10" only when using APX-3318</b>
	CameraBit	Output bit number of connected camera. [Setting range] 8/10/12/14/16/24/30/32/36 <b>* There are some boards that cannot use "30" or "36".</b> <b>* Specify PixelShift when you choose "36".</b>
	PixelShift	Specify number of right shifts for monochrome data. [Setting range] 0/2/4/6/8 <b>* When output bit from camera is "30" or "36"</b> 2bit → Inputs 30⇒24 bit Inputs 36⇒30 bit 4bit → Inputs 36⇒24 bit

<b>ArrangeOption</b>	HighClip	<p>Clip all “256” or more luminance value as “255”.</p> <p>This process emphasizes the dark space.</p> <p>You need to set “CaemraBit=8”.</p> <p>Disable → Disable this function</p> <p>10bit → Clip “256” to “1023” luminance value as “255”</p> <p>12bit → Clip “256” to “4095” luminance value as “255”</p>
	LineReverse	<p>Perform flip horizontal process of image.</p> 
<b>DVAL</b>	DVAL	<p>Set whether use outputted DVAL from camera.</p> <p>Disable → Disable this function</p> <p>Enable → Enable this function</p> <p><b>&lt;APX-3312 only&gt;</b></p> <p><b>Make setting of XDelay to “0”</b></p> <p><b>if you set up this to “Enable”.</b></p>
<b>Arrangement Pattern</b>	Total X Size	<p>Show the total X size that camera outputs.</p> <p>It is set automatically if ini file is loaded at the time of activation of this application. The set values at here are recommended values.</p> <p><b>Do not forget to set up this when you are using APX-3318.</b></p>
	Total Y Size	<p>Show the total Y size that camera outputs.</p> <p>When using PSM, this item is needed to be set up if input size is different from output size.</p> <p>Use in default status in general.</p> <p>(Mark checkbox beside box when you turn this setting on)</p>
	LVAL Delay	<p>Perform delay to LVAL signal outputted from camera.</p> <p>(Unlike X delay, this delay affects to each tap.)</p> <p>It is set automatically if ini file is loaded at the time of activation of this application. The set values at here are recommended values.</p>
	<p>Select tap output pattern of camera link.</p> <p>The output direction of each tap is set up at “Direction”.</p>	
	Direction	Set output direction of each tap.

### 3-2-3. Input Mode Tab

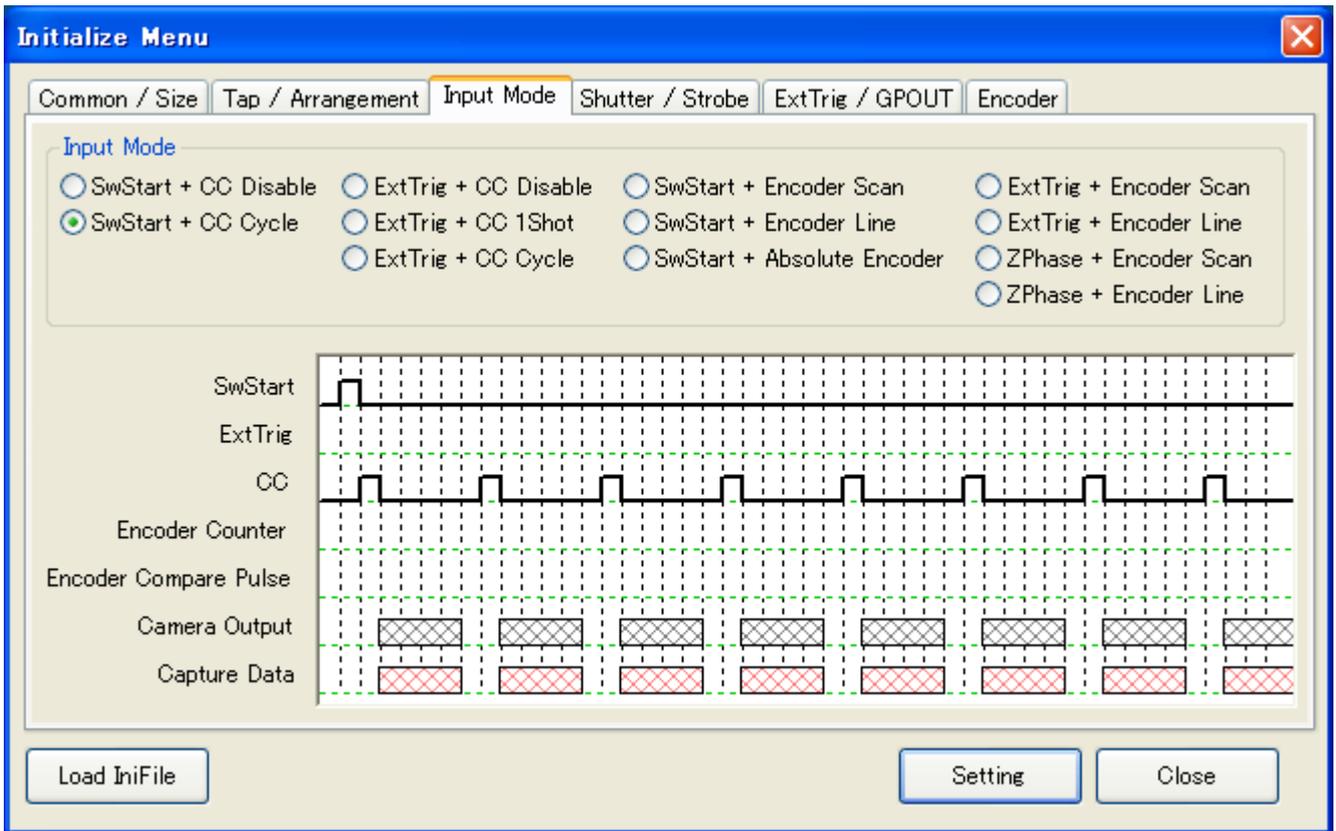


Figure 3-2-3. Input Mode Tab

When you select mode from [InputMode], timing of performance for each capturing is shown at bottom graph. Since the graph shows timing roughly, set up accurate value from each setting tab.

\* Refer to “Library Manual” for more information about encoder.

Input Mode	SwStart + CC Disable	Perform capturing by starting software. Specify when the camera is free run.
	SwStart + CC Cycle	Perform capturing by decided step of CC at starting software. Specify when captures by synchronizing with CC from board.
	ExtTrig + CC Disable	Perform capturing by activating external trigger. Specify when the camera is free run.
	ExtTrig + CC 1Shot	Perform capturing by outputting CC in every external trigger. * Choose this when you input external trigger in every 1 line by line camera.

ExtTrig + CC Cycle	Perform capturing by decided step of CC after starting external trigger. * Choose this when you input multiple lines in 1 external trigger by line camera.
SwStart + Encoder Scan (*1)	Perform capturing in every coincidence pulse of encoder after starting SwStart. <b>※It starts counting encoder after SwStart.</b>
SwStart + Encoder Line (*2)	Encoder coincidence pulse is generated after starting software trigger. Also the next line is captured. <b>※Encoder starts counting after SwStart.</b>
SwStart + Absolute Encoder (*3)	Perform capturing in every coincidence pulse of encoder after starting software.
ExtTrig + Encoder Scan (*1)	Perform capturing in every coincidence pulse of encoder after starting external trigger. <b>※Encoder starts counting after inputting external trigger.</b>
ExtTrig + Encoder Line (*2)	Capture next line after external trigger activates and coincidence pulse of encoder is generated. <b>※Encoder starts counting after inputting external trigger.</b>
ZPhase + Encoder Scan (*1)	Perform capturing in every coincidence pulse of encoder after starting Phase Z. <b>※Encoder starts counting after inputting Phase Z.</b>
ZPhase + Encoder Line (*2)	Capture next line after Phase Z activates and coincidence pulse of encoder is generated. <b>※Encoder starts counting after inputting Phase Z.</b>

(\*1) Relative position encoder scan mode

We recommend using camera with exposure control since interval of CC pulse fluctuates when coincidence pulse of encoder is not constant.

(\*2) Relative position encoder line mode

Keep in mind that error of 1 line occurs since the cycle of camera does not synchronize to coincidence pulse of encoder.

(\*3) Absolute position encoder

We recommend using camera with exposure control since interval of CC pulse fluctuates when coincidence pulse of encoder is not constant.

Encoder count is started by pressing "Start" at [Encoder] tab.

### 3-2-4. Shutter / Strobe Tab

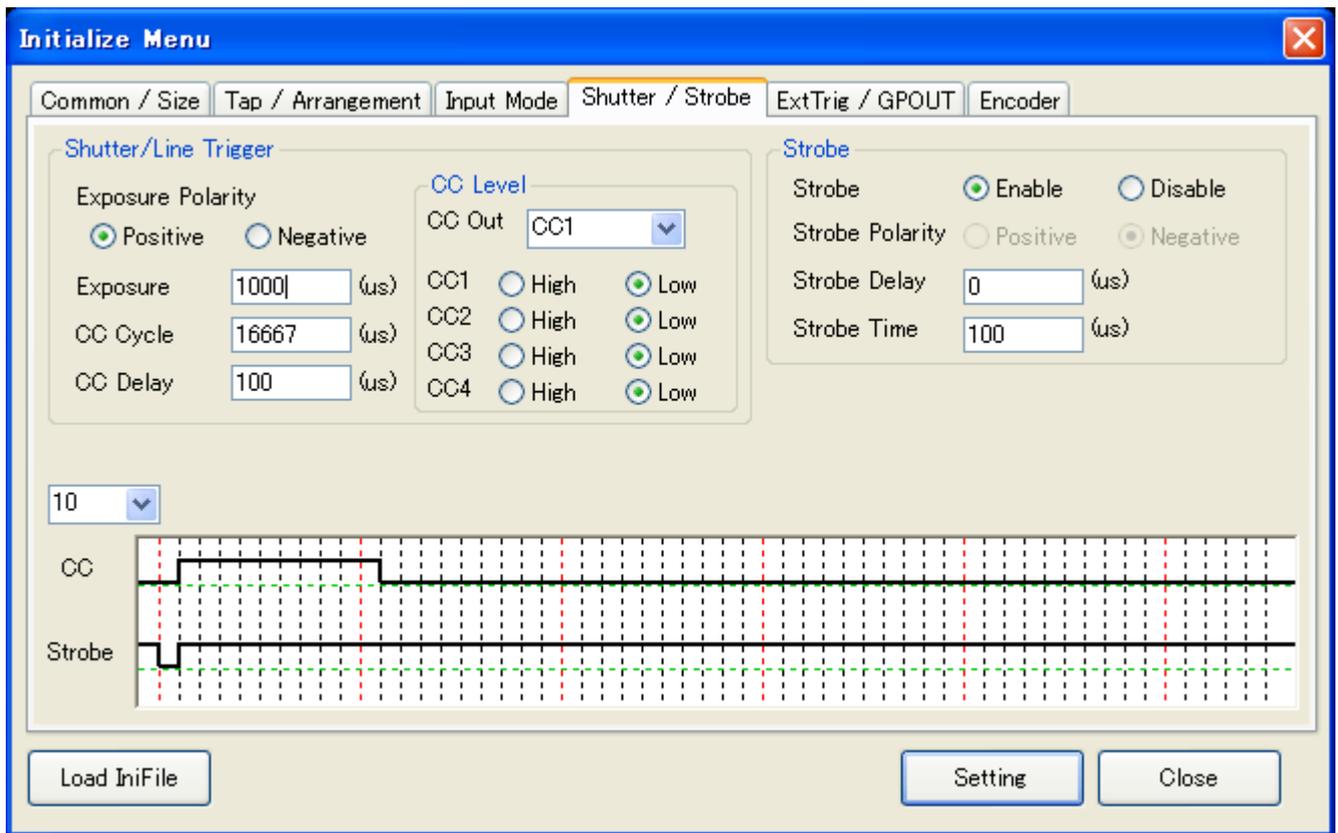


Figure 3-2-4. Shutter / Strobe Tab

<b>Shutter / Line Trigger</b>	Exposure Polarity	Choose logic of shutter trigger. Positive → Positive logic Negative → Negative logic
	Exposure	Set width of exposure time. Specify this in “us”. Specify this as “Exposure < CC Cycle”. [Setting range] 1 ~ 429496729
	CC Cycle	Set exposure cycle. Specify this in “us”. Specify this as “Exposure < CC Cycle”. [Setting range] 1 ~ 429496729
	CC Delay	Set output delay time of CC signal. Specify this in “us”. [Setting range] 1 ~ 429496729
	CC Out	Set pin for outputting CC signal at the time of selecting area camera.

	CC1 ~ 4	Set status of each CC signal. High / Low (Cannot choose CC1/CC2 if line camera is selected.)
<b>Strobe</b>	Strobe	Set whether use or not use strobe. Disable → Use strobe Enable → Not use strobe
	Strobe Polarity	Choose strobe output logic. Positive → Positive logic Negative → Negative logic
	Strobe Delay	Set strobe-signals generating delay time. Specify this in "us". [Setting range] 0 ~ 65535
	Strobe Time	Set strobe-signals generating time. Specify this in "us". [Setting range] 0 ~ 65535

The waveform of graph at bottom changes when you edit each setting. You can use this graph for adjusting timing.

Also you can adjust reducing magnification of graph by pull-down menu at upper left of graph.

### 3-2-5. ExtTrig / GPOUT Tab

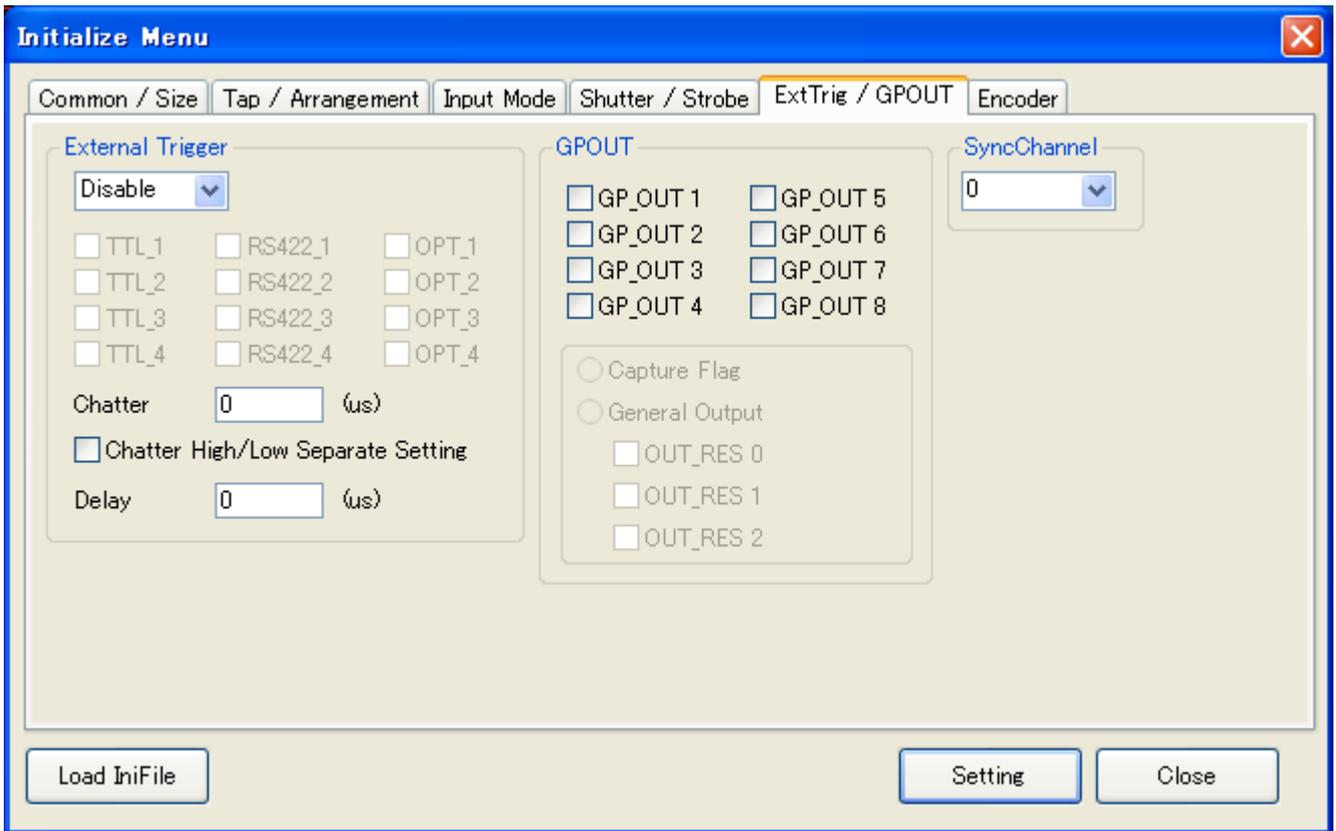


Figure 3-2-5. ExtTrig / GPOUT Tab

<b>External Trigger</b>	Select whether to use external trigger. Disable → Disable this function      TTL      → Use TTL trigger RS422    → Use differential trigger      DIF      → Use new differential trigger <b>&lt;APX-3311 only&gt;</b> When APX-3311 is used, it is specified by check box in TTL_1~4, RS422_1~4, and OPT_1~4. * You can set up same signal for multiple channels.	
	Chatter	Set external trigger disable time. Specify this in "us". [Setting range] 0 ~ 4294967295(0xFFFFFFFF)
	Chatter High/Low Separate Setting	Turn this setting on when you specify High/Low period at external trigger disable time separately. When this setting is turned on, the value of [Chatter] becomes the disable time of High (top 16 bits) and the disable time of Low (bottom 16 bits).

	Delay	Set external trigger detecting delay. Specify this in "us". [Setting range] 0 ~ 4294967295
<b>GPOUT</b>	<p><b>&lt;APX-3312/3313/3318/3662&gt;</b></p> <p>Select whether to use GP_OUT.  Capture Flag : capturing flag  General Output : General output  Selected 'General Output', specify status of GP_OUT 1, OUT_RES1 and OUT_RES2.  Not Checked : Low output  Checked : High output</p> <p>* The status shifts even [Setting] is not pressed.</p> <p><b>&lt;Other board&gt;</b></p> <p>Specify status of GP_OUT 1~8  Not Checked : Low output  Checked : High output</p>	
<b>SyncChannel</b>	0: Not synchronize 1~4: It synchronizes with the specified channel.	

### 3-2-6. Encoder Tab

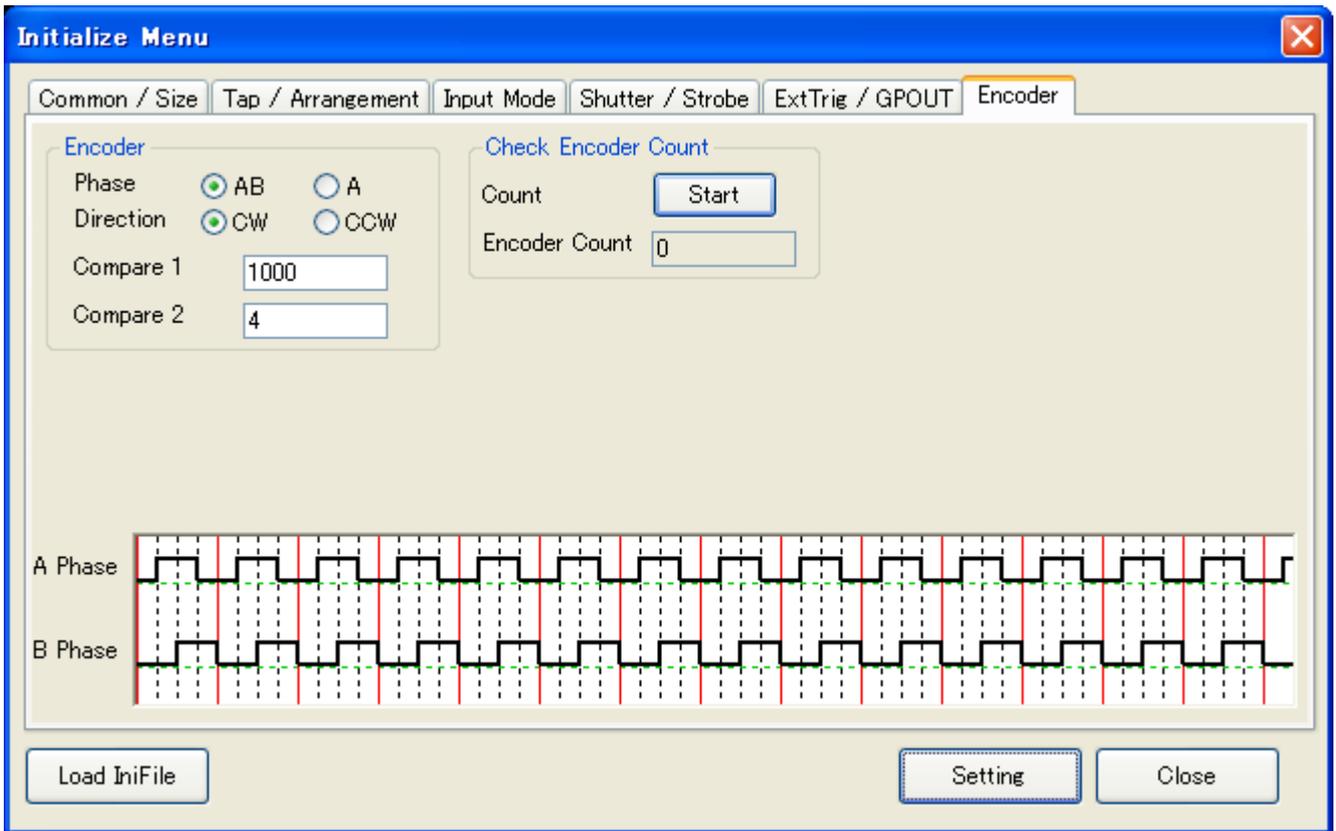


Figure 3-2-6. Encoder Tab

<b>Encoder</b>	Phase	Choose encoder pulse. AB → Phase AB A → Phase A
	Direction	Choose rotate direction of encoder. CW → Clockwise CCW → Counter clockwise
	Compare 1	Number of delay pulse generated between starting input and actually performing input [Setting range] 0 ~ 4294967295
	Compare 2	Input interval pulse number [Setting range] 0 ~ 4294967295
<b>Check Encoder Count</b>	Count	Start/Stop getting encoder counting value. The interval of encoder is counted with 100ms period. Also if absolute position encoder mode is used, it starts counting encoder when it starts, and stops count when it stops.

	Encoder Count	Get the count value of encoder. Definition of return value changes by mode of encoder.  Relative position encoder : Total counted number of encoder Absolute position encoder : Absolute Position Encoder Counted Value
--	---------------	--

The waveform of graph at bottom changes when you edit each setting. You can use this graph for adjusting timing.

### 3-2-7. Record

When you select "Initialize(I) - Record" at menu, the following dialog (Figure 3-2-7) appears.

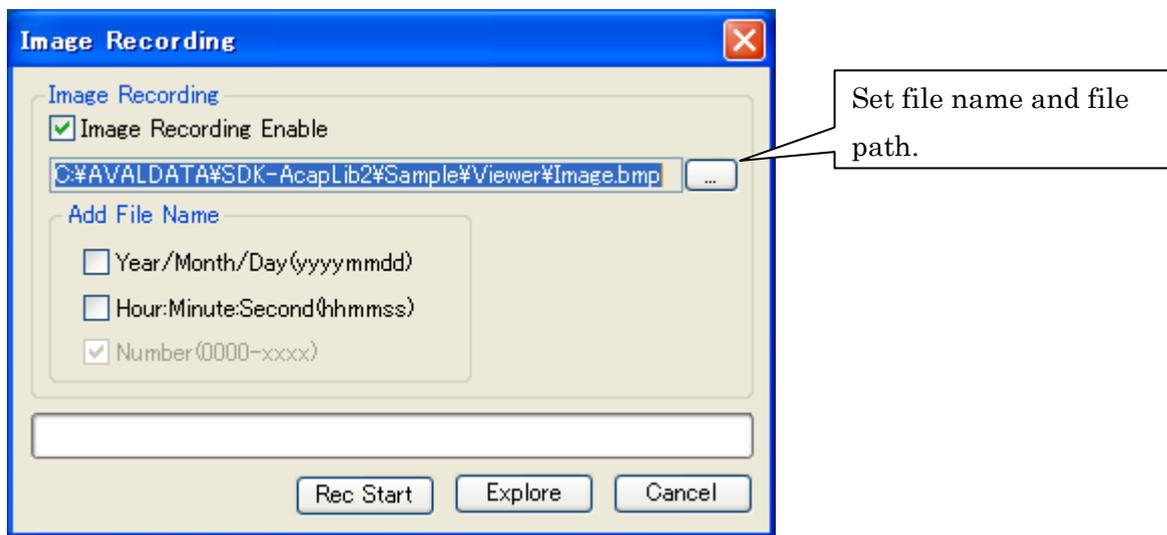


Figure 3-2-7. Image Recording Dialog

#### <Image Recording Enable>

This check box performs valid/invalid setup about continuation image recording.

If it sets up 'checked' and streaming [Grab (Live)] is performed, it is saved by the file name specified after streaming the number (MemoryNum) part image of memories set up on the initialize dialog.

#### <Year/Month/Day(yyyymmdd)>

Checked → A date is added to a file name.

#### <Hour/Minute/Second(hhmmss)>

Checked → A time second is added to a file name.

#### <Number(0000~xxxx)>

Consecutive numbers are always added to a file name.

### 3-3. Input

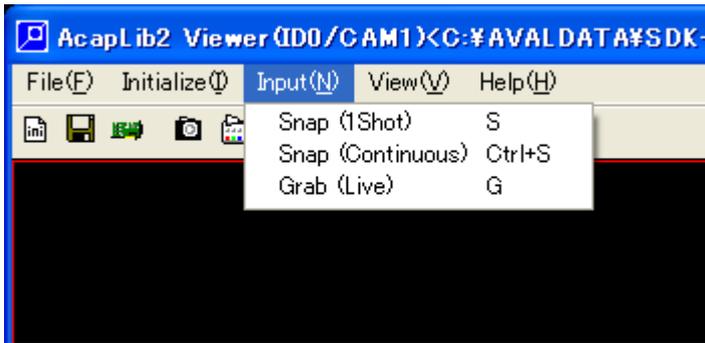


Figure 3-3. Input menu

#### <Snap (1Shot)>

It performs one shot snap.

You can perform same process by typing “S” on window.

It captures one shot snap every time when menu is chosen, and shows on main window.

You can cancel input by selecting it again when it is in input waiting status by external trigger or others.

#### <Snap (Continuous)>

It performs one shot snap repeatedly.

You can perform same process by typing “Ctrl + S” on window.

Main window shows/updates capturing image during input.

The input stops when it is selected again.

Also you can stop input by typing “Ctrl+S” during performance.

#### <Grab (Live)>

It performs streaming.

You can perform same process by typing “G” on window.

Main window shows/updates capturing image during input.

The input stops when it is selected again.

Also you can stop input by typing “G” during performance.

### 3-4. View

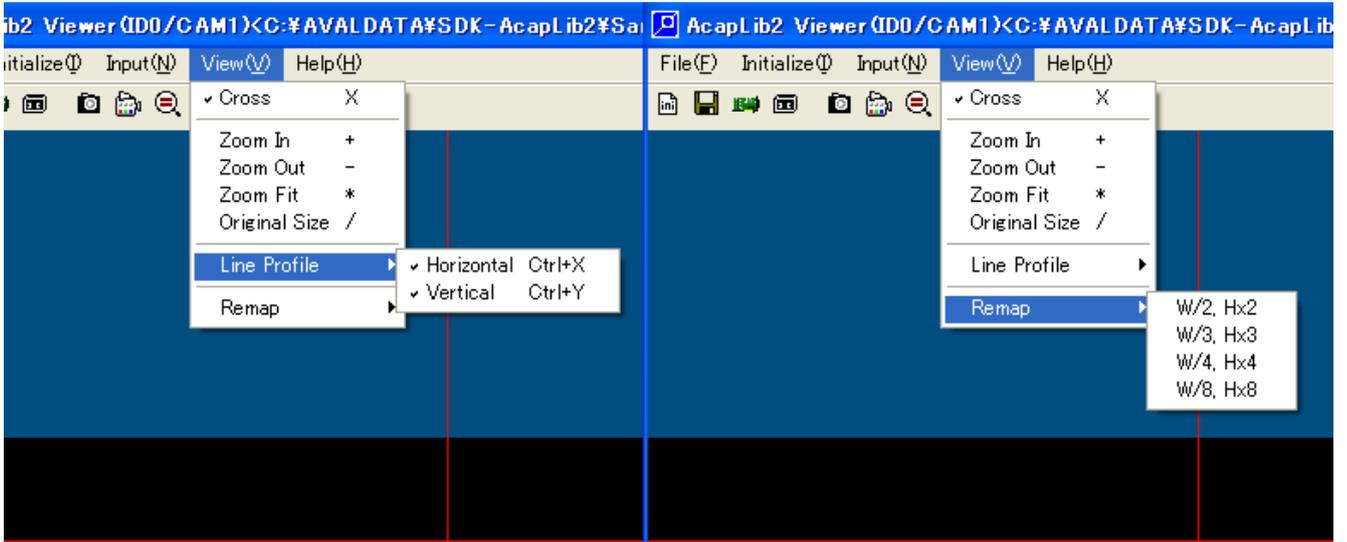


Figure 3-4-1. View Menu

#### <Zoom In>

It shows magnification view based on center of image. (Intersecting line moves in the center)

The magnification ratio is x1, x2, x4, x8, x16, x32, x64, and , x128. (Ration is fixed)

You can change magnification ratio by using “+” key.

#### <Zoom Out>

It shows reduction view based on center of image. (Intersecting line moves in the center)

You can change reduction ration by using “-” key.

#### <Original Size>

It shows view in original size (x1) based on center of image. (Intersecting line moves in the center)

You can view image in original size by using “/” key or button .

#### <Line Profile>

You can change whether shows this line profile or not by “Ctrl+X” or “Ctrl+Y” key.

### <Cross>

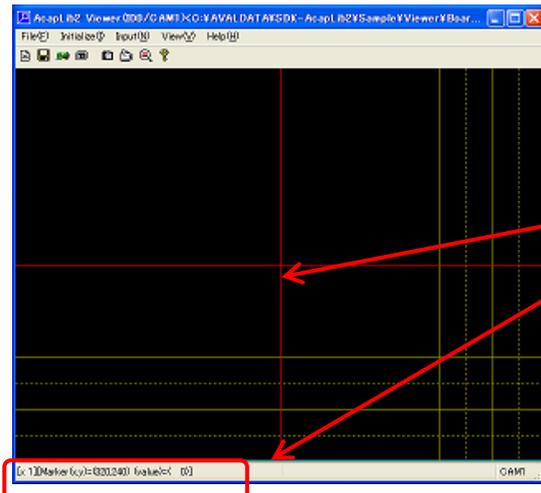
It is a red intersecting line which is shown on the window.

The location of intersecting coordinates and luminance is shown at status bar.

You can change whether shows this intersecting line or not by “X” key.

You can change position of this intersecting line by using four directions key “↑↓←→”.

You can change position of captured image by using four directions key “Ctrl+↑↓←→”.



The luminance value of this point is shown at status bar.

Figure 3-4-2. Cross

### 3-5. Help

When you select [Help]-[Version], driver that application uses (\*. sys), version of library (\*. dll), and FPGA Data version and system information of hardware is shown with version of this application.

With the 'Save Info' button, information is saved by text format.

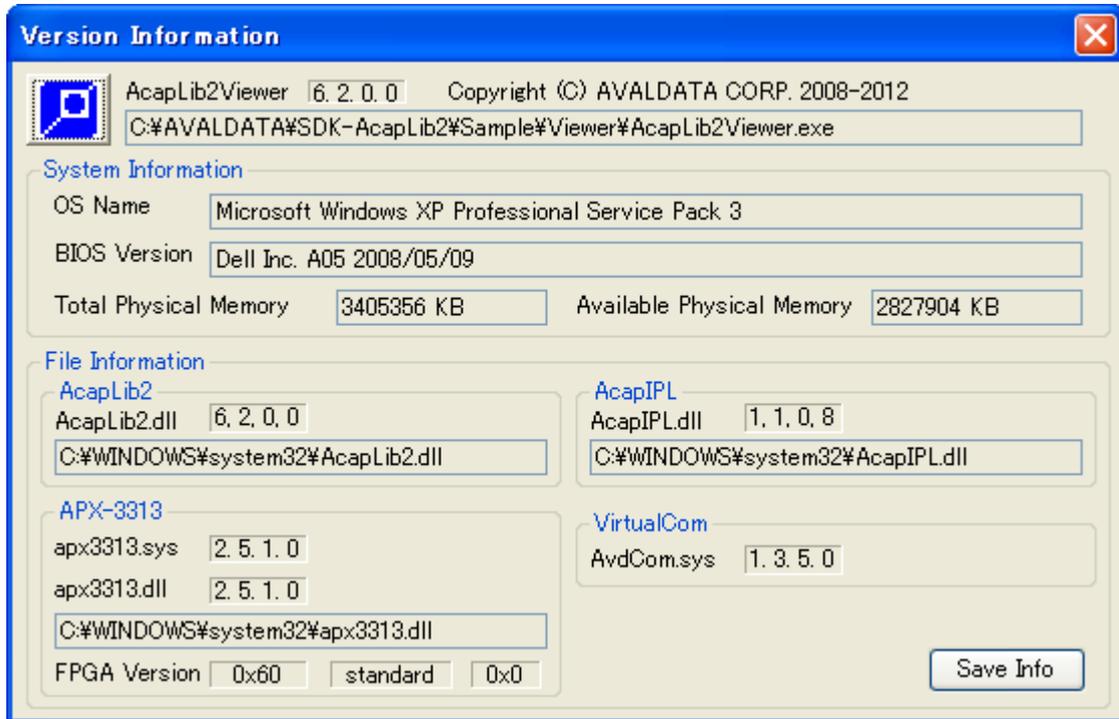


Figure 3-5. Version information

It opens "Doc folder" at upper class of this application when [Help]-[Document] is selected. Various documents are stored in the folder. It becomes error when folder is not found.

### 3-6. Window Title

It shows board number and input channel at the window title. Also it shows the currently selected ini file path.

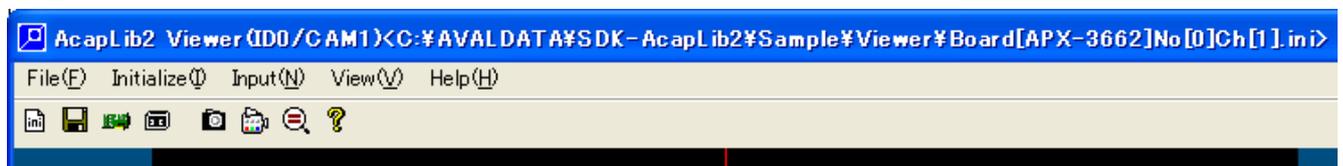


Figure 3-6. Window Title

### 3-7. Status Bar

The variety of information is shown at status bar.

- ① Information of [Display magnification], [position of mouse cursor], and [luminance value]
- ② Information of [Image input time (ms)] and [Frame rate (fps)]
  - Time for Bayer conversion (ms) is added when you turn Bayer conversion on.
  - Line delay compensation time is added when you turn line delay compensation on.
  - \* FPS (Frame per seconds) may get influence from processing time and drawing time.
- ③ The display CH that currently selected



Figure 3-7. Status Bar

### 3-8. Main Window

This section shows the operation of mouse and performance on main window.

<Mouse>

Drag right button	Move whole images.
Left-click	Move red intersecting line to where mouse points. Refer to [3-4. View] for more information.
Center scrolling	Change display magnification. Refer to [3-4. View] for more information.

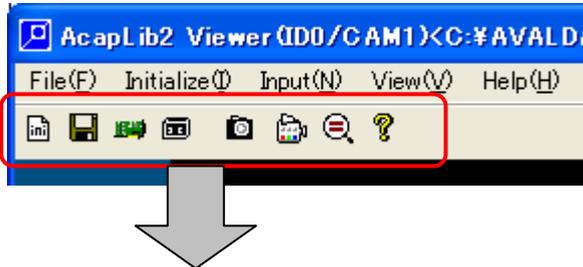
<Window>

When it moves during dragging frame of main window the image moves on bases of centre position of the window at that time.

## Chapter 4. Tool Bar

There is a tool bar in this application.

Some items in menu are able to be executed by buttons in tool bar.



Icon	Description	Operation
	Show dialog about loading ini file. Same process as selecting [File]-[Load ini File] at menu. Same process as inputting [Ctrl] + [W] key.	3-1. File
	Save image currently on the window to the file. Same process as selecting [File]-[Save Image File] at menu. Same process as inputting [W] key.	3-1. File
	Show dialog about initializing board. Same process as selecting [Initialize]-[Board] at menu. Same process as inputting [B] key.	3-2. Initialize
	Perform continuous image recording. Same process as selecting [Initialize]-[Record] at menu. Same process as inputting [ I ] key.	3-2-7. Record
	Perform one shot snap. Same process as selecting [Input]-[Snap (1Shot)] at menu. Same process as inputting [S] key.	3-3. Input
	Perform streaming. Same process as selecting [Input]-[Grab (Live)] in menu Same process as inputting [G] key.	3-3. Input
	View image in original size (central position). Same process as selecting [View]-[Original Size] at menu. Same process as inputting [/] key.	3-4. View
	Show dialog about version information. Same process as selecting [Help]-[Version] at menu. Same process as inputting [V] key.	3-5. Help

## Chapter 5. Revision History

Version	Revised Date	Revised Contents
<b>A</b>	2008.4.1	First Edition
<b>B</b>	2008.5.9	<ul style="list-style-type: none"> <li>• Add articles about connecting camera at “3-2.Initialize”</li> </ul>
<b>C</b>	2008.6.16	<ul style="list-style-type: none"> <li>• Add articles about limit of X size by rearrangement at “3-2.Initialize”.</li> </ul>
<b>D</b>	2008.9.18	<ul style="list-style-type: none"> <li>• Add articles about APX-3313</li> <li>• Add following descriptions in “3-2.Initialize” HighClip Data Arrange Setting</li> </ul>
<b>E</b>	2009.2.20	<ul style="list-style-type: none"> <li>• Add articles about frame grabber selector dialog box in “Chapter 2. Starting Software”.</li> <li>• Add articles about “Chapter 4. Tool Bar”</li> </ul>
<b>F</b>	2009.7.31	<ul style="list-style-type: none"> <li>• Add articles about APX-3318</li> </ul>
<b>G</b>	2009.10.16	<ul style="list-style-type: none"> <li>• Change dialog in “3-2.Initialize” to tabbed dialog.</li> <li>• Able to use Bayer conversion by IPP</li> <li>• Cancel the limit of window size in case of using full-screen display</li> </ul>
<b>H</b>	2010.2.3	<ul style="list-style-type: none"> <li>• Add details about setting range of Bit width.</li> <li>• Add details about setting range of shift</li> <li>• Add articles about LVAL Delay</li> <li>• Revise fault that occurs when capturing size is small</li> <li>• Revise fault that image blurs when capturing is performed by size, which cannot be divided by 32 pixels, at Bayer conversion</li> </ul>
<b>I</b>	2010.3.31	<ul style="list-style-type: none"> <li>• <a href="#">Add function of line delay compensation</a></li> <li>• <a href="#">Add viewing frame rate at status bar</a></li> <li>• Add continuous Snap button at tool bar</li> <li>• <a href="#">Able to use zoom in / zoom out / original size</a></li> <li>• Revise fault at inputting/saving color 10 bit when using APX-3318</li> <li>• Revise fault that value of LVAL_DELAY becomes half when “Base / 2Tap camera” is selected in APX-3318</li> <li>• Make as being supported by rolling shutter camera</li> </ul>
<b>J</b>	2010.9.15	<ul style="list-style-type: none"> <li>• Make as being supported by APX-3311</li> <li>• Change design of window for initialization</li> <li>• Add function that saves JPEG/GIF/TIFF/PNG files</li> <li>• Change Bayer conversion method to original from IPP method.</li> </ul>
<b>K</b>	2010.11.30	<ul style="list-style-type: none"> <li>• Revise name of execute file</li> <li>• Revise information of versions</li> <li>• Revise fault that setting at initialization screen [Input Mode]⇒[ExtTrig + CC Cycle] is</li> </ul>

		<p>changed to [ExtTrig + CC 1Shot] after activate that screen again. (When using line sensor)</p> <ul style="list-style-type: none"> <li>• Revise fault that last 1 pixel is not calculated when SW line delay compensation is turned on.</li> <li>• Revise fault that saving image is not performed properly when SW line delay compensation is turned on.</li> </ul>
<b>L</b>	2011.10.07	<ul style="list-style-type: none"> <li>• Add articles about the continuous image recording capabilities.</li> <li>• Add articles about the file output function in a version information dialog.</li> </ul>
<b>M</b>	2012.07.30	<ul style="list-style-type: none"> <li>• Add articles about [Tap/Arrangement].</li> <li>• Add articles about [ExtTrig/GPOUT].</li> </ul>
<b>N</b>	2012.12.21	<ul style="list-style-type: none"> <li>• Add articles about “Line Profile” capabilities</li> <li>• Delete continuous Snap button at tool bar</li> </ul>
<b>o</b>	2013.04.24	<ul style="list-style-type: none"> <li>• Add articles about [3-2-1].</li> <li>• Add articles about [3-2-5].</li> </ul>
<b>P</b>	2013.07.09	<ul style="list-style-type: none"> <li>• Add articles about [3-2-7]</li> <li>• Add articles about [3-4]..</li> </ul>

## Chapter 6. Support Offices

If you have any inquiry, please contact to following our customer service.

# AVAL DATA CORPORATION

<b>HQ Machida Office Sales department</b>  1-25-10, Asahimachi, Machida-shi, Tokyo 194-0023, Japan	 042-732-1030
	 042-732-1032

<b>Technical Support</b> Technical questions about products, such as hardware and software		<a href="mailto:support@avaldata.co.jp">support@avaldata.co.jp</a>
<b>Inquiry of price, specification, and more</b> Questions about product price, basic specification, stock, and more		<a href="mailto:sales@avaldata.co.jp">sales@avaldata.co.jp</a>
<b>Product Guidance</b>		<a href="http://www.avaldata.co.jp">http://www.avaldata.co.jp</a>
Inquiry registration time : <b>Monday – Friday (Exclude public holiday) / 9:00~17:00</b>		

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