Photron FASTCAM Viewer

for High Speed Digital Imaging

User's Manual

（Additional Section）

Rev 2015-4E

Photron

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Introduction

Thank you for purchasing your Photron FASTCAM series high-speed camera system.

This manual contains the additional function and warnings necessary for using the Photron FASTCAM Viewer (referred to as PFV).

Please read the entire manual before using the software.

If any part of this manual is unclear, contact Photron using the contact information printed at the back of this manual.

Manual Notation

The following icons and symbols are used in the explanations in this manual.

Icon/Symbol	Description
	This symbol indicates content that should always be read.
	This symbol indicates instructions that should always be followed when using the software, or things to be careful of when using the software.
	This symbol indicates supplementary items to be aware of when using the software.
	This symbol indicates the location of a reference.
	This symbol indicates a space for you to use for making notes.
“ ”	This symbol is used to indicate the names of items on a screen, references, dialog names, and keyboard keys.
[ ]	This symbol is used to indicate screen names, button names, and menu names.
< >	This symbol is used to explain operating procedures in diagrams and supplementary items.

Table of Contents

Photron FASTCAM Viewer User's Manual (Additional Section)

Chapter.1 Summary

The following describes the newly added functions and their operations

1.1. Outline of Additional Section of User's Manual

This additional section contains the functionalities and their basic operations that were added as a result of PFV (Photron FASTCAM Viewer) version upgrade.

Chapter 1. Summary
This Chapter shows the version upgrade history.

Chapter 2. New Functions and Operations
This Chapter discusses the newly added functionalities and their operations.

1.1.1. History of version upgrades

History of Version Upgrades

Date	Version Number	Added Functions
December 2, 2014	3.5.3	·IDP-Express R2000 and R2000-F are now compliant with Windows 8.1 operation. ·Mini UX100 compliance with Export Control Order ·SA-Z compliance with Export Control Order ·SA-X2 compliance with Export Control Order ·SA5 compliance with Export Control Order ·SA4 compliance with Export Control Order ·SA1.1 compliance with Export Control Order ·SA-X2 change of the number of partitions ·SA-X2 added fuction for Rec_On_Cmd trigger mode ·SA-X2 added function for Random_Loop trigger mode ·SA-X2 added function for Straddling mode ·SA-X2 added function for Trig-Expose mode ·SA-X2 change of shutter speed steps ·SA-X2 added number of triggers for Random and Random Reset trigger modes
April 5, 2015	3.5.4	·FASTCAM Multi exclusive function (LED/Laser control) ·FASTCAM Multi exclusive function (View window display) ·FASTCAM Multi exclusive function (Error message display) ·Improved dialog for starting-up from a PCS file ·Compatibility with FASTCAM Mini WX camera
July 24, 2015	3.6.0	·Compatible with FASTCAM Mini AX100/50 ·Newly added application functionality for network configuration ·SDK development environment changed to Visual Studio 2013

Date	Version Number	Added Functions
September 28, 2015	3.6.1	·Compatible with FASTCAM Mini AX200 ·Added a new feature to automatically save to the SD card ·Support for layout saving in time synchronization ·Support for conversion factor settings for each channel in the waveform data ·Support for the saving of conversion factor to the waveform data ·Support for the updating of custom time codes in the waveform graph ·Support for the numerical output of line profiles ·Display units for customized time codes changed from two to four decimal places ·Support for parallel saving on all models of Gigabit Ethernet cameras


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Chapter.2 New Function Operation

The following describes the new function and the operation

2.1. PFV Ver.3.6.1 Added Functions

2.1.1. Compatible with FASTCAM Mini AX200

FASTCAM Mini AX 200 has a high-quality mode that can be switched on and off for shooting. The high-quality mode is turned OFF by default and improves the shooting image quality when turned ON.

The image quality increases when the high-quality mode is set, but the configurable shooting speed is slower.

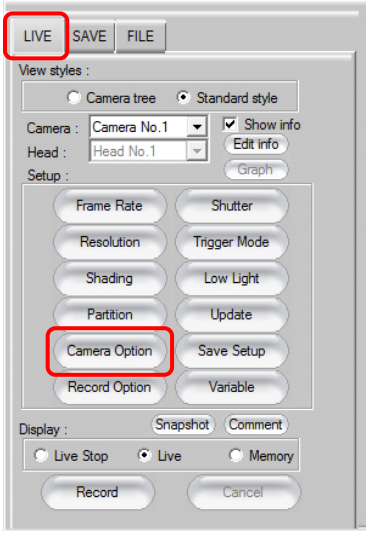
- High-quality mode OFF
  - Maximum shooting speed: 216,000 fps to 900,000 fps (resolution is 128 x 16 pixels)
  - Full frame shooting speed: 6,400 fps

- High-quality mode ON
  - Maximum shooting speed: 212,500fps to 540,000fps (resolution is 128 x 16 pixels)
  - Full frame shooting speed: 4,000 fps

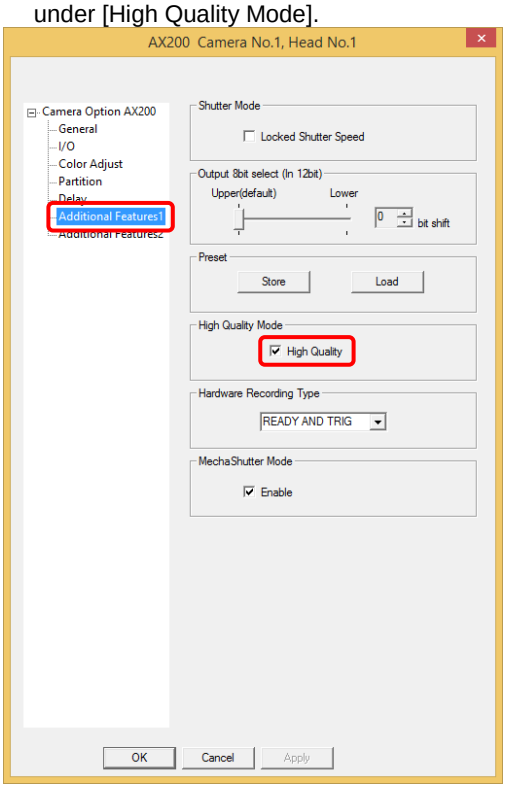
Caution

- The maximum shooting speed differs in the export controlled model.

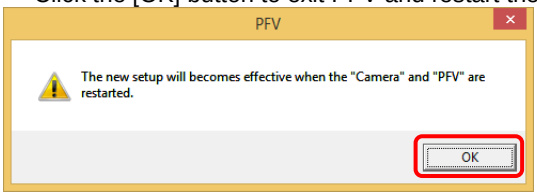
1. Display the control panel's [Live] tab and click the [Camera Option] button.



2. Click [Additional Features1] from the tree on the left side and check the [High Quality] box under [High Quality Mode].



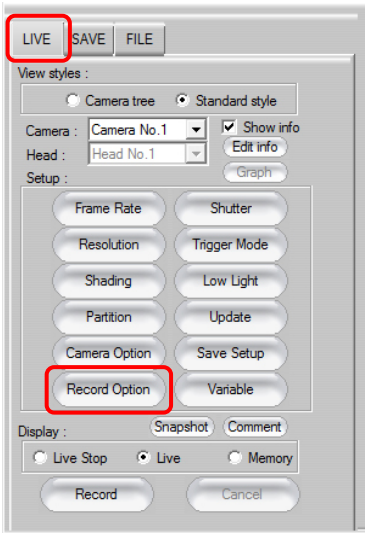
3. The restart message is displayed.
Click the [OK] button to exit PFV and restart the camera.



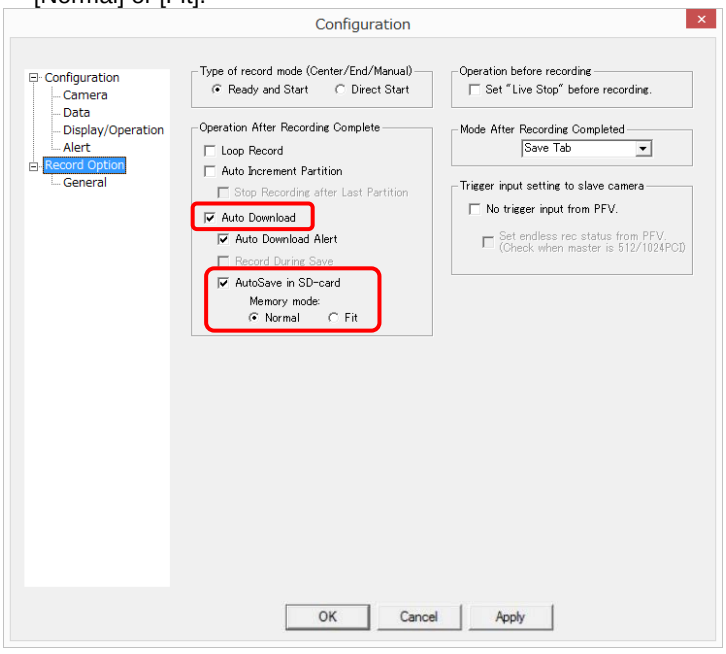
2.1.2. Automatic save settings (SD card)

You can set the file to be saved automatically to the SD card after shooting (recorded to the camera).

1. Display the control panel's [Live] tab and click the [Record Option] button.



2. Check the [Auto Download] and [AutoSave in SD-card] boxes in that order and then select [Normal] or [Fit].



Item	Description
Normal	Shooting is allowed to the full capacity of the camera memory.
Fit	Shooting duration is limited within the SD card's capacity.

3. Click the [OK] button.
   After the settings are entered, the file is automatically saved to the SD card when recording is finished.

Caution

- When automatically saving to the SD card, shooting cannot start again until the saving is finished.

2.1.3. Parallel download for all Gigabit Ethernet cameras

Parallel download function has been expanded. It supports all of cameras which have Gigabit Ethernet interface.

Caution

- PC has to have same quantities of LAN ports as connecting cameras when the following cameras are included in the network; “SA-Z”, “SA-X2”, “SA-X”, “Multi”, “Mini AX”, “Mini WX”, “Mini UX”, “SA8” or “SA7”. Otherwise saving images may fail.

2.2. PFV Ver.3.6.0 Added Functions

2.2.1. SDK – Change of development environment

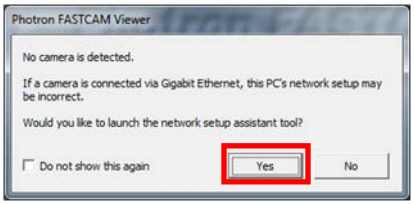
The development environment for SDK has been changed to Visual Studio 2013. As a result, the Visual Studio runtime is needed for development work starting with this new version.

2.2.2. Application functionality for network configuration

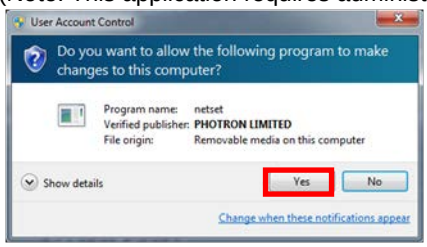
I. Newly added application functionality for network configuration

A) Start-up flow

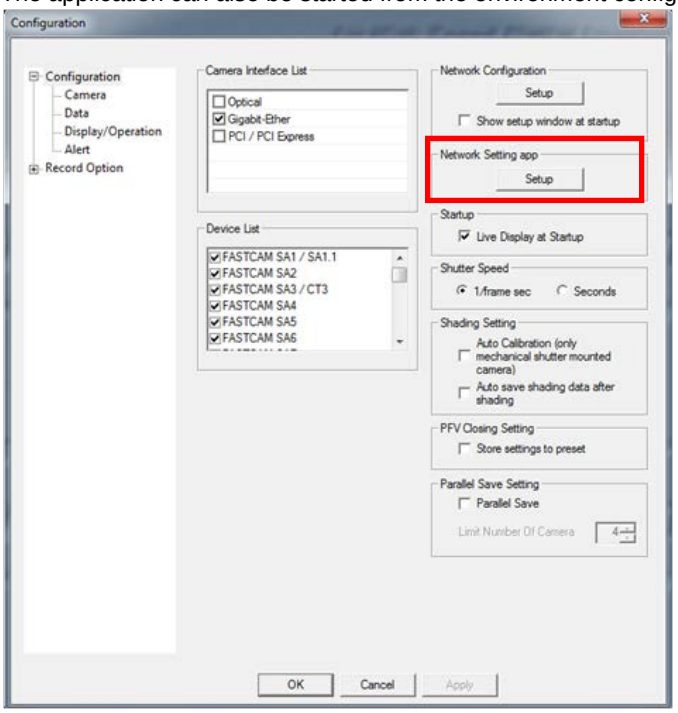
If no camera is detected during start-up of the PFV, a message is displayed as shown below:



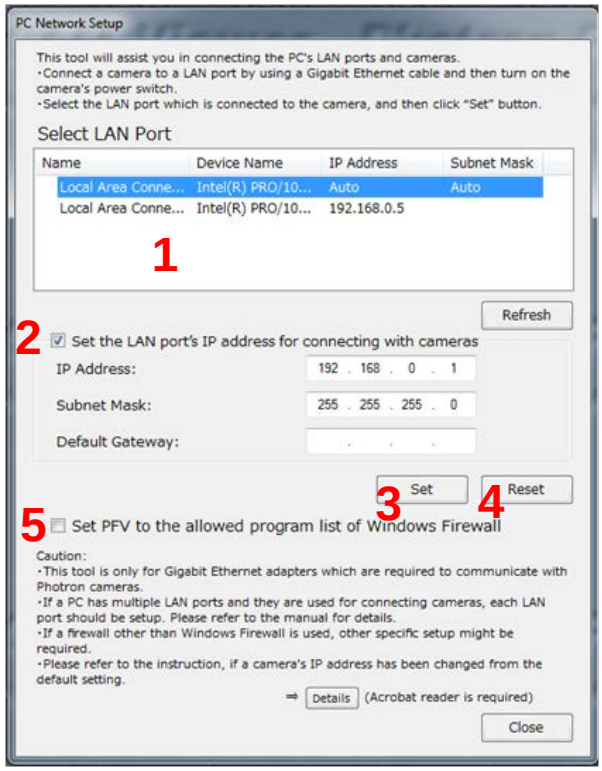
When you click [Yes], the below confirmation screen is displayed.
(Note: This application requires administrative right.)



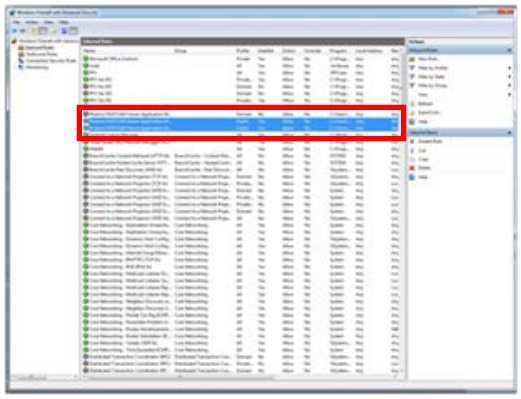
The application can also be started from the environment configuration window.



B) Behavior of application

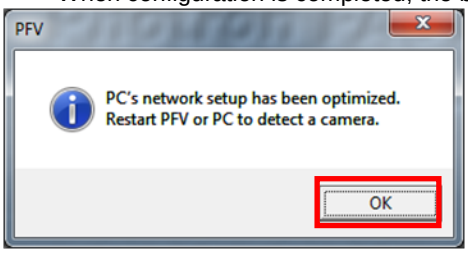


1. Select an adapter to set up.
2. For [Set the LAN port's IP address for connecting to cameras]:
   ・When checked ON, enter IP address, subnet mask and gateway as necessary.
   ・When checked OFF, use DHCP connection, not IP address or others.
3. When the reset button is clicked, IP address and other parameters return to the status right after startup of the application.
4. When the checkbox is checked ON, an exceptional configuration is added, and it is deleted when checked OFF. At startup of the application, the exceptional configuration is forced to be set up, with the checkbox being automatically checked ON.



C) Completion of configuration

When configuration is completed, the below message is displayed:



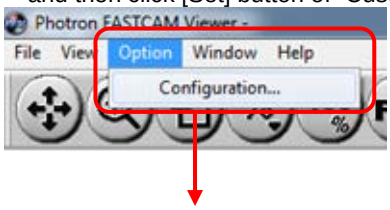
Restart PFV or PC.

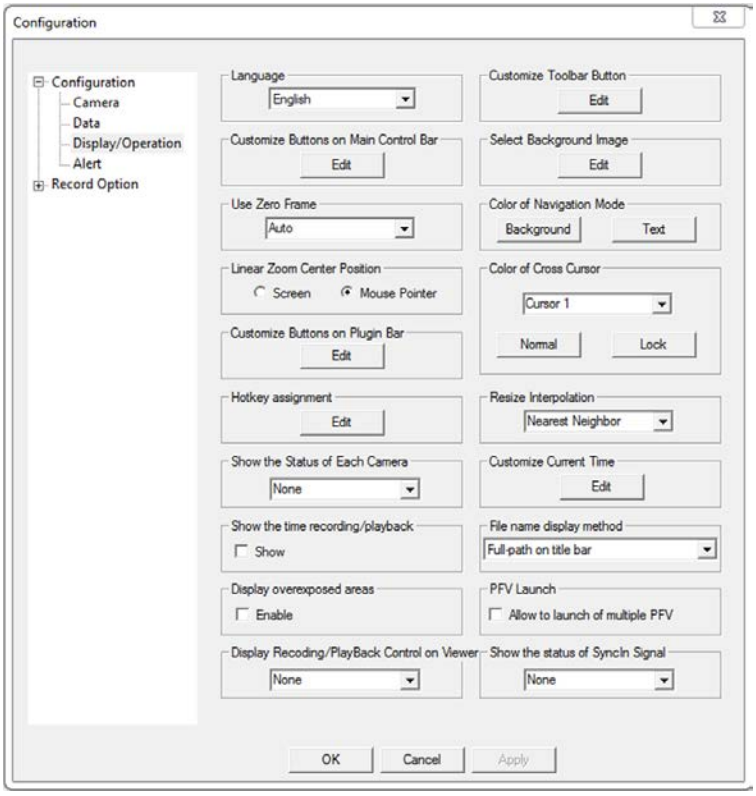
2.3. PFV Ver.3.5.4 Added Functions and Improvements

2.3.1. FASTCAM Multi exclusive function (LED/Laser control)

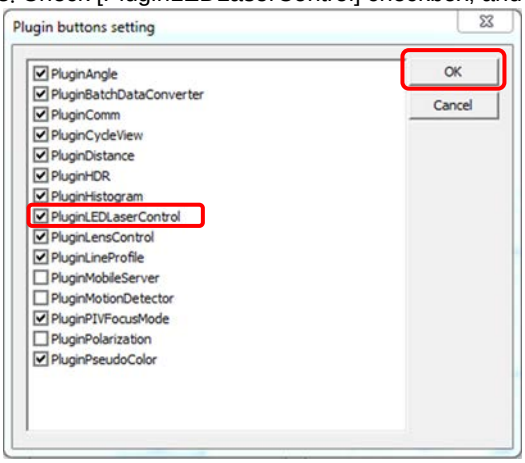
The LED light and laser pointer are now directly controlled from the PFV.
For controlling the LED light and laser, the following configurations should be made in advance.

1. From the menu bar, go to [Option] → [Set environment] to display “Set environment” dialog box.
2. From the tree display in the left pane, click “Display/operate setting” below “Set environment” and then click [Set] button of “Customize plugin bar”.



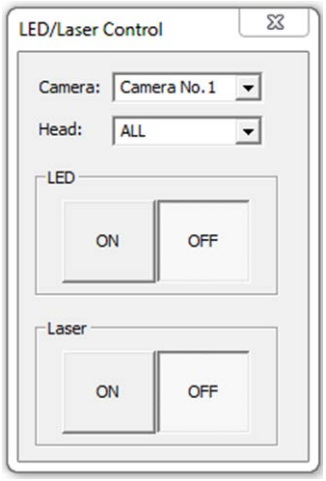


3. Check [PluginLEDLaserControl] checkbox, and click [OK].

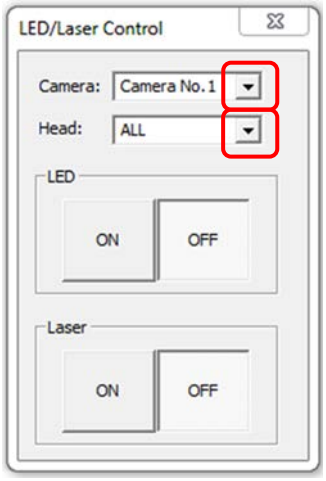


4. In the plugin bar, click [LED Light/Laser Control] button.

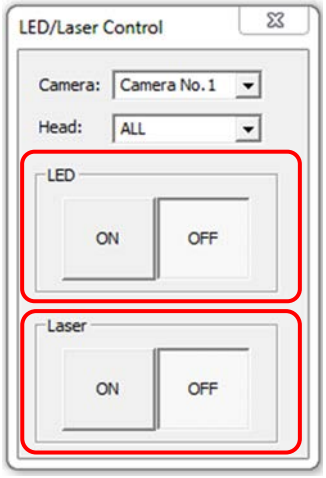
5. LED/Laser control dialog appears.



6. Select a camera and head that you wish to use from the pulldown menu.



7. Make a necessary setting of ON or OFF for LED and Laser, respectively.



Important

Before start using the Laser, be sure to look into the Warning page of the FASTCAM Multi LED Light Option Hardware Manual, and be careful while using it.

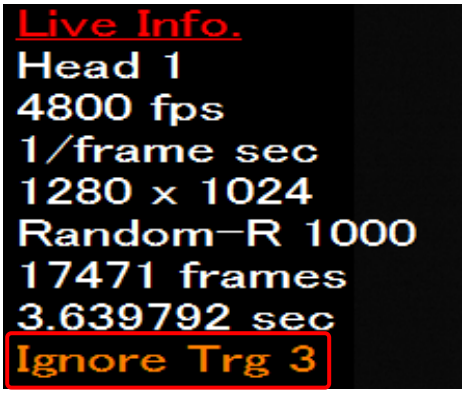
- Do not look at the laser beam directly, or look into the laser beam exit.
- Do not point the laser beam to a person. It may damage the eyesight.

Caution

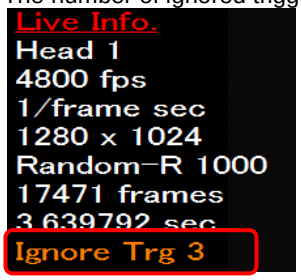
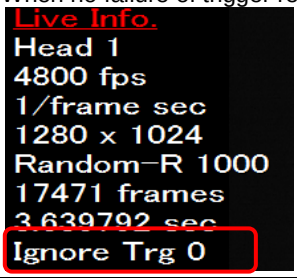
- “LED/Laser Control” is a function that is only available with FASTCAM Multi.
- “LED/Laser Control” is a function that can only be controlled when the dedicated built-in LED (optional) is installed.

2.3.2. FASTCAM Multi exclusive function (View window display)

In the upper left corner of the view window, information on various camera settings (view window information) is displayed.



表示情報サンプル	説明
OverSync ！ (Applicable to slave camera only)	Indication of an over-synchronization status. *Note: “OverSync!” is displayed when a frequency higher than the preset frequency enters the camera. It is displayed in Framing and Saving tab modes. 1. When an OverSync status comes up, an indication of “OverSync!” appears in orange color.  2. When no OverSync status is present, nothing is indicated.

Ignore Trg　3（0）	In Random Reset mode, the number of triggers that are not recognized (ignored triggers) as such is displayed. If the number of ignored trigger is zero, “Ignore Trg 0” is displayed. It is displayed in Framing and Saving tab modes. The number of ignored triggers(example: when 3)  When all triggers are recognized.(example: when ignored trigger is 0) When no failure of trigger recognition has happened. 

Caution

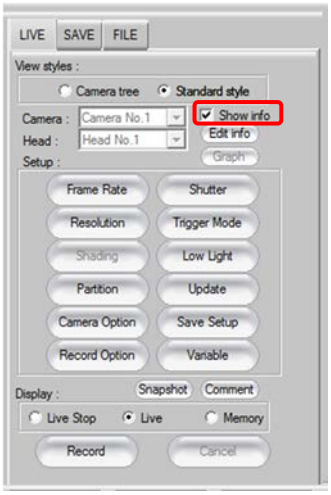
Indication of “OverSync” and “Ignore Trg” is a function only available with FASTCAM Multi.

To configure the system for view window information display, the following presettings are needed:

*Example: Display of OverSync

1. Switching between display/hide

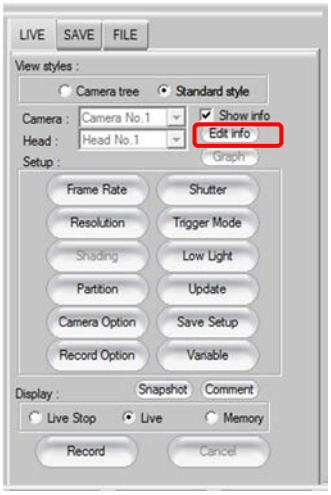
Display of view window information is switched on or off by checking or unchecking the “Display information” checkbox on each tab.



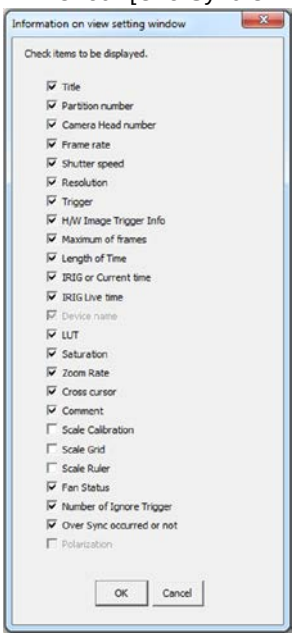
2. Customizing displayed information

Displayed information can be customized in the following manner:

2-1. Click “Edit information” button on each tab of the control panel.

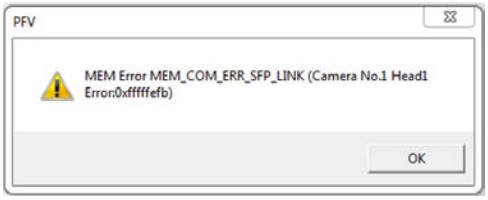


2-2. Check [OverSync ON when using external sync] checkbox, and click [OK] button.



2.3.3. FASTCAM Multi exclusive function (Error message display at start-up and during operation)

The below popup box appears when an error comes up when starting up and operating PFV.
A popup window, something like below, comes up:
* Example: An error at startup



Caution

- “Error message” is a function only available with FASTCAM Multi.

Reference

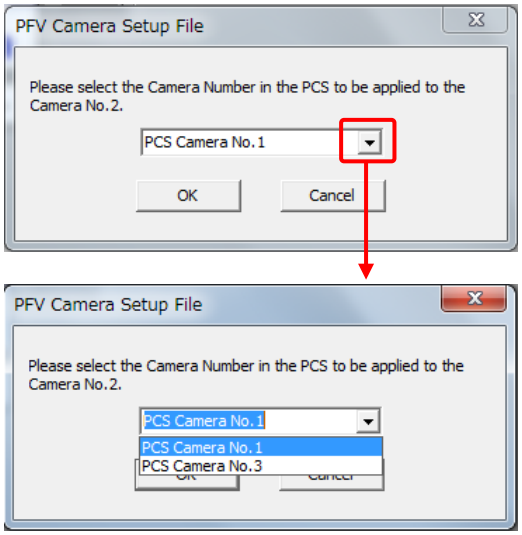
- When an error is displayed, refer to the FASTCAM Multi Hardware Manual for instructions.

2.3.4. Improvement made on dialog for PFV startup by double-clicking PCS file

Being actuated by double-clicking the file, the PFV searches for cameras, and then configures them with the framing conditions saved in the PCS file.

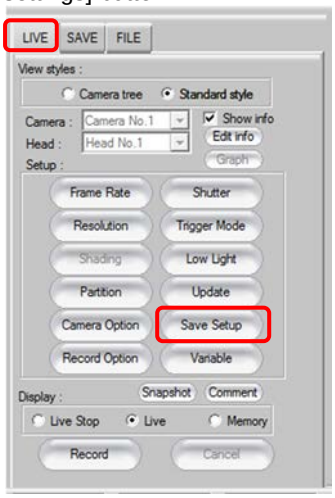
Normally, when the PCS file is read after the PFV has started, the system does not read the PCS file if there are changes in the order and the number of cameras. But, when the system is actuated from the PCS, the system works in the following manner (Note when reading the PCS file after the PFV's startup, the system now works in the same manner as before):

- If more cameras are found than the number of cameras saved in the PCS file, the system recognizes only the number of those cameras saved in the PCS file.
- If fewer cameras are found, the system recognizes such cameras.
- If any camera is found having a different camera model name and/or type from what is saved in the PCS file, such a camera is not recognized.
- When settings for multiple cameras are saved in a PCS file, and when the connection order of the cameras are changed at the startup of the system, a dialog window for camera setting selection such as which of the camera settings saved in the PCS file should be used, or should NOT be used, for a camera being connected to the system for the next framing session. The selected setting is configured on the camera now being connected.
  For example, if settings for three cameras – SA-X2, SA1.1 and SA-X2 - are saved in the PCS file, and for the next framing session, the order of the cameras is changed to SA1.1 SA-X2 and SA-X2, the first and second cameras are now different from what is saved in the PCS file. Then, the following dialog is displayed:
  The following example is a dialog window asking which settings, Camera 1 or Camera 3, saved in the PCS file should be applied to the second camera being connected now.
  If you click "Cancel", neither one is applied, but the cameras are recognized.



To make a PCS file, the following procedure is required:

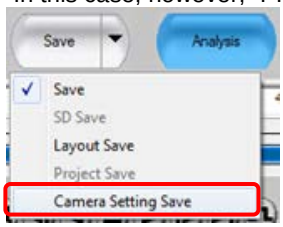
1. After setting necessary conditions, click “Framing” tab on the control panel, and click [Save settings] button.



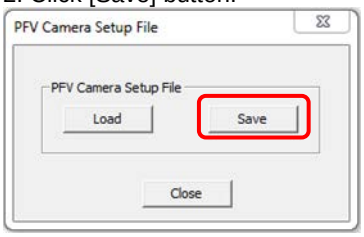
Supplement

- Settings can also be saved if you click ［▼］ on the right of [Normal saving] button, and then click [Save camera setting file] button.

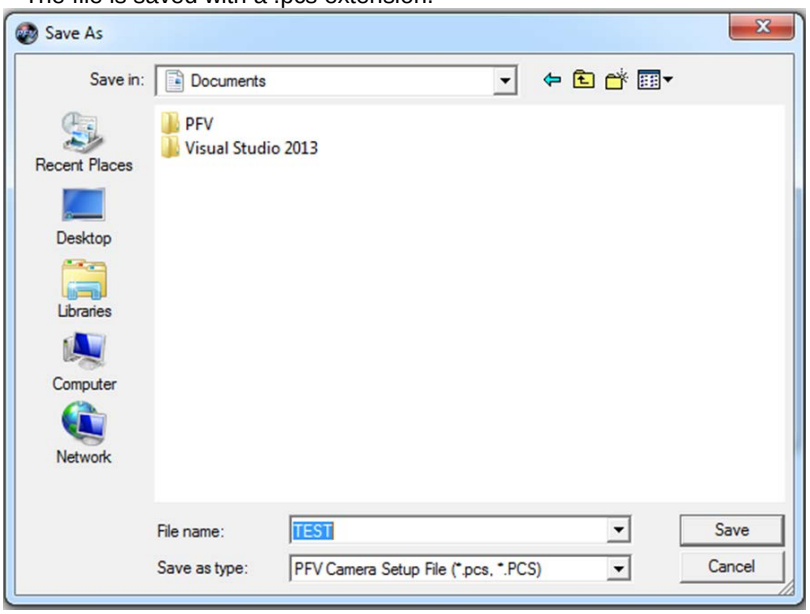
  In this case, however, “PFV camera setup file” dialog will not appear.



2. Click [Save] button.



3. After assigning a place for storage, enter a name in “File Name” box and click [Save] button. The file is saved with a .pcs extension.



2.4. PFV ver 3.5.3 Added Functions and Improvements

2.4.1. Addition of OS compliant IDP-Express R2000/R2000-F

・IDP-Express R2000
・IDP-Express R2000-F

Execute PFV by "Run as administrator" in the right click context menu when IDP Express is used with Windows8.1.

2.4.2. Addition of type 200K

Export control-compliant type 200K has been added to the following models whose export is strictly controlled under provisions of Export Control Order.

・FASTCAM Mini UX100
・FASTCAM SA-Z
・FASTCAM SA-X2
・FASTCAM SA5
・FASTCAM SA4
・FASTCAM SA1.1

2.4.3. FASTCAM SA-X2 Trigger mode

REC ON CMD mode is newly available.

2.4.4. FASTCAM SA-X2 TRG-EXP Display function

TRG-EXP display function is newly available.

2.4.5. FASTCAM SA-X2 Fan control

The fan control function is newly available.

2.4.6. FASTCAM SA-X2 Trigger mode change in limitation

The limit on the number of recordings in RANDOM and RANDOM RESET modes has been changed to allow up to 128 recordings. Without this limitation, the number of recordings may be set to any number up to the maximum number of frames available for recording.

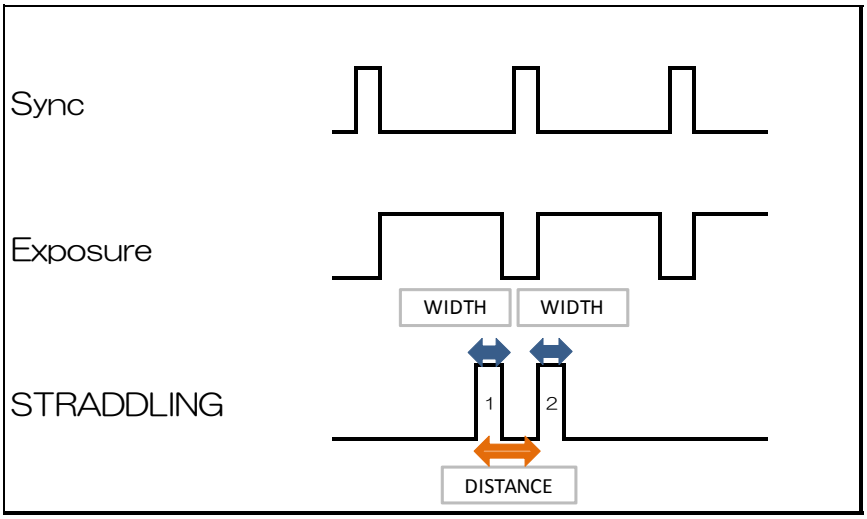
2.4.7. FASTCAM SA-X2 Recording in partitioned memory

SA-X2 now allows the memory to be partitioned into 128 segments, maximum.

2.4.8. FASTCAM SA-X2 Output of pulse signal for straddling

SA-X2 can now output pulse signal for straddling for PIV measurement application.

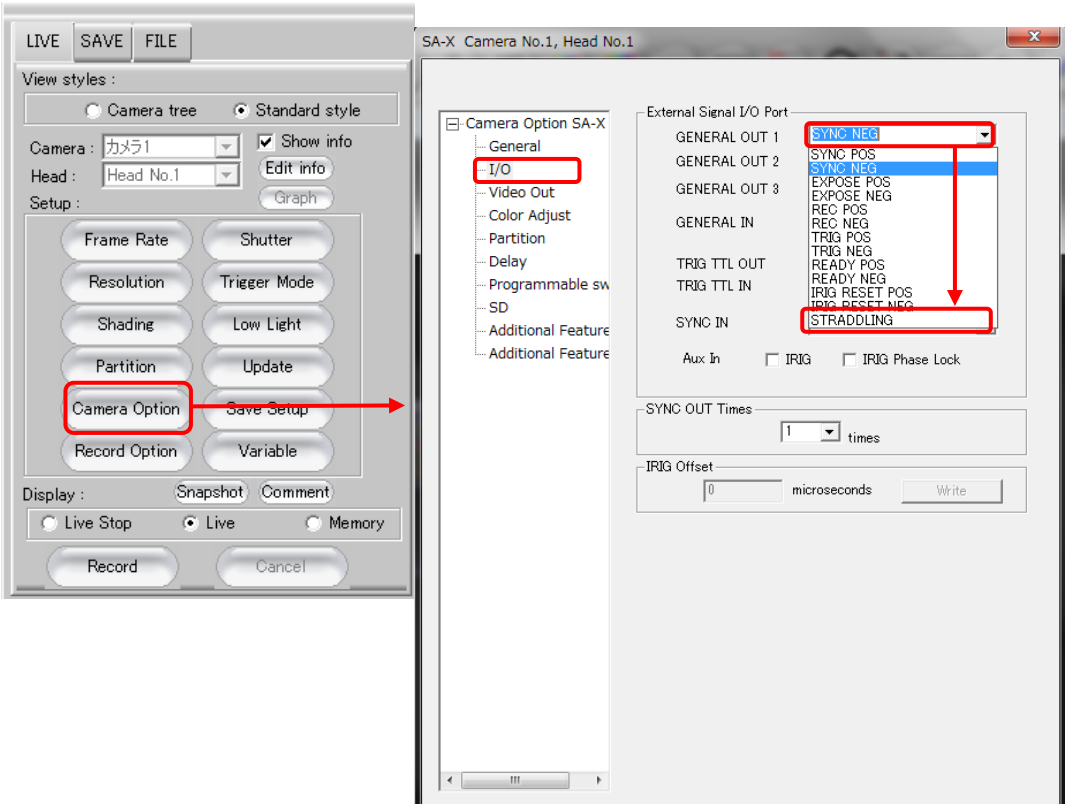
Pulses 1 and 2 have the same pulse width.
By manipulating the delay, the width of and the distance between pulses 1 and 2 can be set.
To adjust the distance, the position of pulse 1 is changed while pulse 2 position is fixed.



While the minimum width is fixed to 100 ns, the minimum distance is varable depending on shutter speed.

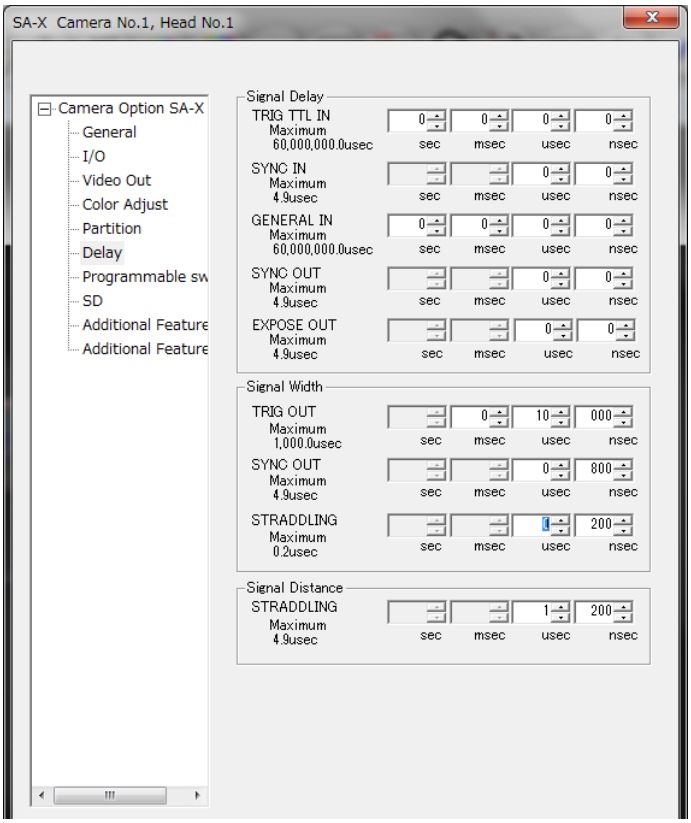
To output pulse signal for straddling, the following setting is necessary.

1. Click [Set individual camera] button, then, from [External in-out setting] button, select t out of [GENERAL OUT 1 -3] a terminal on which required signal should be outpu, and finally select [STRADDLING].



2. Click [Signal delay setting] button and set the width fo [Straddling signal] in [Signal width setting].
   *Setting can be made in increments of 100 ns.

3. Set the distance in [Straddlilng signal] of [Signal delay setting].
   *Setting can be made in increments of 100 ns.



2.4.9. FASTCAM SA-X2 Trigger mode (RANDOM LOOP mode)

RANDOM LOOP mode is a trigger mode, similar to RANDOM MODE, where each time a trigger is input, only a predetermined number of frames are saved in memory.

The difference is that RANDOM LOOP mode continues framing, by using the memory as a loop memory unit, and overwriting from the first frame until the trigger input is cut off to stop framing.

When a recording of the predetermined number of frames ends, and if the number of frames remaining in memory to be recorded is smaller than the predetermined number, the system goes back to the first frame of the memory and starts overwriting the image data that was written in the previous recording cycle.

For example, suppose a duration for a RANDOM FRAME recording is predetermined 1000 frames on a system with a memory capacity of 3500 frames, and four trigger inputs are given.

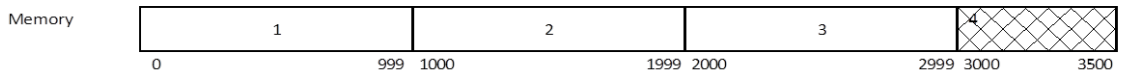
In this case, the number of frames recorded reaches 3,000 after the third trigger, with 500 frames remaining unused in the memory. The system, without recording image data in the remaining 500 frames, goes back to the first frame of the memory and starts overwriting

The overwriting sequence is therefore:

1st 1,000 ⇒ 2nd 1,000 ⇒ 3rd 1,000 ⇒ 1st 1,000 ⇒ 2nd 1.000 etc.

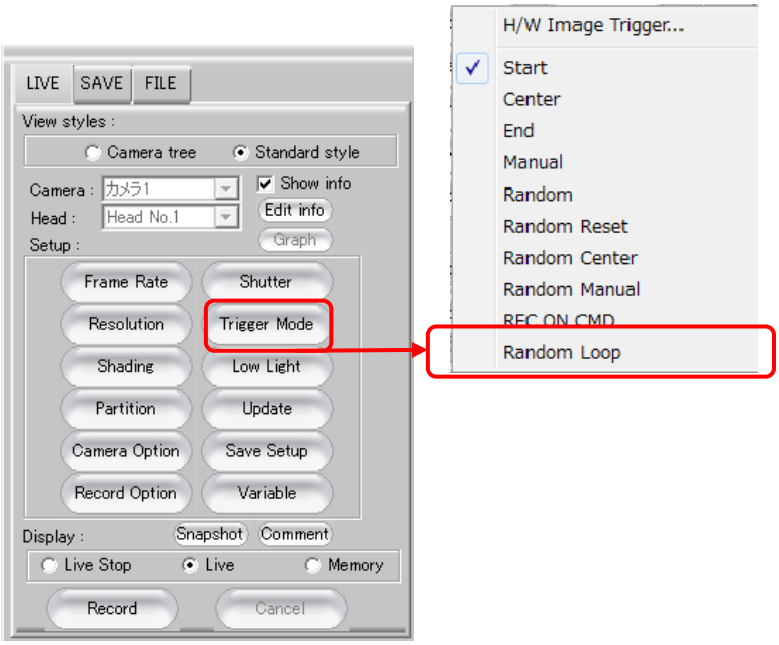
with the last 500 frames always remaining unused (see the below illustration).

The number of frames to be recorded with one trigger can be set to any number from 1 (one) up to the maximum number of frames available to record in the memory.

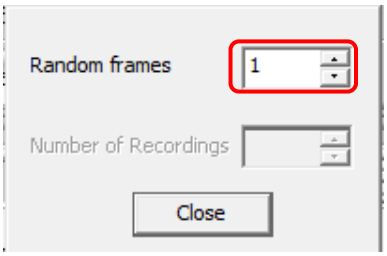


When recording in RANDOM LOOP mode, the following presetting is necessary:

1. Click [Trigger mode] button and select [Random Loop].



2. Specify the number of frames to be recorded at each trigger input.
Input a desired numbe in [Random frames].

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Contacting Photron

For inquires related to PFV, contact Photron at the contact information listed below.
Additionally, the following items will be verified when inquiring, so please prepare them in advance.

Items Verified	Concrete Example
Contact Information	Company, school or organization name, customer contact name, contact phone number, contact e-mail.
Product Name	The Photron FASTCAM Viewer version number and the high-speed camera name. For the version number, check the version information.
Condition of the system and what is known about it.	

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