

***Remote Controller
with LCD***

 **User's Manual**

Rev. 1.12 E

Photron

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- Product specifications and manual contents are subject to change without notice.
- PHOTRON LIMITED bears no responsibility for any results by using our products nor by applying this manual to any operations.

Introduction

Thank you for your purchase of the Photron high-speed camera accessory, the "**Remote Controller with LCD**". ("The LCD Keypad" hereafter)

This manual contains the operating instructions and warnings necessary for using the remote controller.

Please read the entire manual before using it.

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

After you finish reading the manual, store it in a safe place along with the warranty card and refer back to it whenever necessary.

Manual Notation

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

Icon/symbol	Explanation
	Indicates the information should always be carefully read and taken into consideration because of its vital importance for the best result of operation
	Indicates the information shows good directions and instructions to follow to avoid mistakes.
	Indicates the information gives additional tips for better understanding of the system.
	Shows the section(s) and page(s) to refer to for additional information.
	Indicates the page or blank is for writing memos.



Using the Manual

This page explains the structure of the manual.

- **Introduction**

Gives overall explanation of the manual and safety precautions. .

- **Chapter 1. Overview**

Shows overview of the product and its features.

- **Chapter 2. Basic Operation**

Shows overview of the components that make up the product. This chapter also explains basic remote controller ([**keypad**] hereafter) operation and a list of items that should be checked against each of the components before using the product.

- **Chapter 3. Recording/Playback Operations**

Explains operations related to recording and playback.

- **Chapter 4. System Settings**

Explains the settings related to recording and replaying, and other detailed system settings.

- **Chapter 5. Product Specifications**

Shows specifications of the system.

- **Chapter 6. Warranty**

Explains how the warranty works.

- **Chapter 7. Contacting Photron**

Lists contact points to use when contacting Photron in case of the product malfunction, or asking questions.

Using the Product Safely and Correctly

In order to prevent injury to yourself and others, and to prevent damage to property, carefully read and observe the following safety precautions.

Photron has given its full attention to the safety of this product. For your better understanding, however, the extent of damage and injury potentially caused by ignoring the content of the safety precautions and using the product incorrectly is explained below. You are urged to pay careful attention to the safety precautions when using the product.



Warning

This symbol indicates actions that carry the risk that a person could receive a serious or even fatal injury.



Caution

This symbol indicates actions that carry the risk that a person could receive a moderate injury or that damage to physical property might occur.

- The safety precautions to observe are explained with the following symbols.



This symbol indicates actions that require caution.



This symbol indicates actions that are prohibited and must be avoided.



This symbol indicates actions that must always be performed.

European Union (and EEA) only



“CE” mark indicates that this product complies with the European requirements for safety, health, environment and customer protection. “CE” mark equipments are intended for sales in Europe.



These symbols indicate that this product is not to be disposed of with your household waste, according to the WEEE Directive (2002/96/EC), the Battery Directive (2006/66/EC) and/or your national laws implementing those Directives.



This product should be handed over to a designated collection point, e.g., on an authorized one-for-one basis when you buy a new similar product or to an authorized collection site for recycling waste electrical and electronic equipment (EEE) and batteries and accumulators.

Improper handling of this type of waste could have a possible impact on the environment and human health due to potentially hazardous substances that are generally associated with EEE. Your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources.

For more information about the recycling of this product, please contact your local city office, waste authority, approved scheme or your household waste disposal service or visit www.photron.com. (EEA: Norway, Iceland and Liechtenstein)

This product is in conformity with the protection requirements of EU Council Directive 2014/30/EU (Class A) on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

 **Warning**



- Do not perform actions that will damage the cable or connector.

(Do not damage the cable, modify it, use it near a heater, excessively bend, twist or pull on it, place heavy objects on it, or bundle it.)

Using the cable when damaged can cause fire, electric shock, or a short circuit.



- Do not insert metallic objects inside, or pour liquids such as water on, the product.

Doing so can cause fire, electric shock, or malfunction from short circuit or heat.



- Do not disassemble or modify the product.

There are high voltages inside the product that can cause electric shock.



- Do not plug in or unplug the power cord with wet hands.

Doing so can cause electric shock.



- Completely insert the plug until it locks into the connector.

Not fully inserting the plug can cause fire from electric shock or heat.



- When a problem occurs, immediately pull the plug from the connector on the high-speed camera.

- When a foreign substance or liquid, such as metal or water, gets inside.
- When the outer case is broken or damaged, such as from a fall.
- When the camera produces smoke, a strange smell, or strange sound.

Using the system in these conditions might cause a fire or electric shock.



Caution



- Always unplug the connector when cleaning the system or when it is unused for a long period of time.

Leaving or storing the product connected to the power source might cause fire from insulation deterioration or electrical discharge.



- Do not place the product in a location where the temperature gets unusually hot.

The trunk and inside of a car can get especially hot in summer.

Doing so can cause the outer case and internal components to deteriorate or cause a fire.



- Do not place the product in a location prone to oily smoke or steam, or in a location with a lot of humidity or dust.

Oil, moisture, and dust conduct electricity, which can cause a fire or electric shock.



- Ambient temperature 0-40°C, humidity 85% RH or lower, maximum altitude 2000 m or lower, and no condensation. Using the product outside of these limits can cause malfunction.



- Do not store the product in a location where the temperature goes -20°C or lower or 60°C or higher.

Also ensure that condensation does not form.



- This product is for indoor use, do not use it outdoors.

Do not use in dusty locations. Using the product outside of these limits can cause malfunction.



- When shipping, remove the connected cable and use the original packaging or a dedicated carrying case.

Do not ship the equipment in an environment where the temperature goes -20°C or lower or 60°C or higher. Also, prevent condensation from forming during shipment.

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Chapter 1. Overview

1.1. Product Overview and Features

1.1. Product Overview and Features

The remote controller (Keypad) makes it possible to operate a high-speed camera by connecting it to the **KEYPAD** connector on the camera body. The Keypad is hot-pluggable: it can be plugged into and unplugged from the camera while power is on.



For SA series type.

Camera connector name	Signal	Camera connector model name	Remote controller connector model name
KEYPAD	Keypad signal	PT02A-12-10S (023)	PT06A-12-10P (023)

For SA-X type.

Camera connector name	Signal	Camera connector model name	Remote controller connector model name
KEYPAD	Keypad signal	G52L0C-P10QJ00-0000	S22L0C-P10MJG0-820S

Chapter 2. Basic Operation

2.1. About the Components

2.2. Device Connections

2.3. Remote Controller (Keypad) Basic Operation

2.1. About the Components

2.1.1. Components

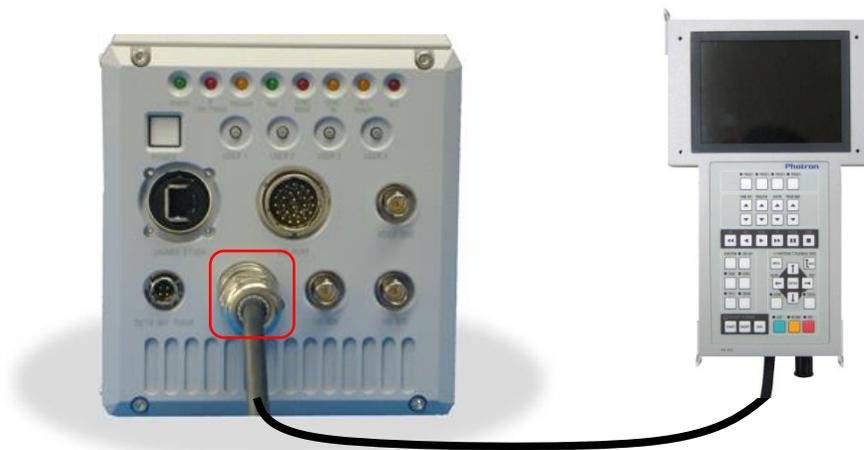
The product's standard components are listed below. Remove the components from the packaging and check them.

- | | | |
|----|--|---|
| 1. | Remote controller unit (Keypad) | 1 |
| 2. | Remote Controller with LCD User's Manual (this manual) | 1 |
| 3. | Warranty card | 1 |

2.2. Device Connections

2.2.1. Connecting the Remote Controller (Keypad)

Connect the cable of the Keypad to the plug marked "KEYPAD" on the processor of the high-speed camera as shown below.



SA series



SA-X

Supplement

- The photos show example connections to the FASTCAM SA-series cameras.
- The Keypad is hot-pluggable: it can be plugged into and unplugged from the high-speed camera while power is on.

The Keypad has a VIDEO OUT connector (BNC). You can monitor the live image from the camera on an external monitor connected to the Keypad as shown below.

(The Keypad does NOT include an external monitor or BNC cable)



Example Cable/Device Connections

! Caution

- VIDEO OUT of the Keypad does not support the SDI or HD SDI output.
(SA1/1.1, SA4, SA5 and SA2)

2.3. Basic Operation of the Keypad

The Keypad has been designed with the intention of making frequently-repeated functions easily accessible. Detailed settings have also been organized in the menu which can be operated efficiently using the ARROW keys.

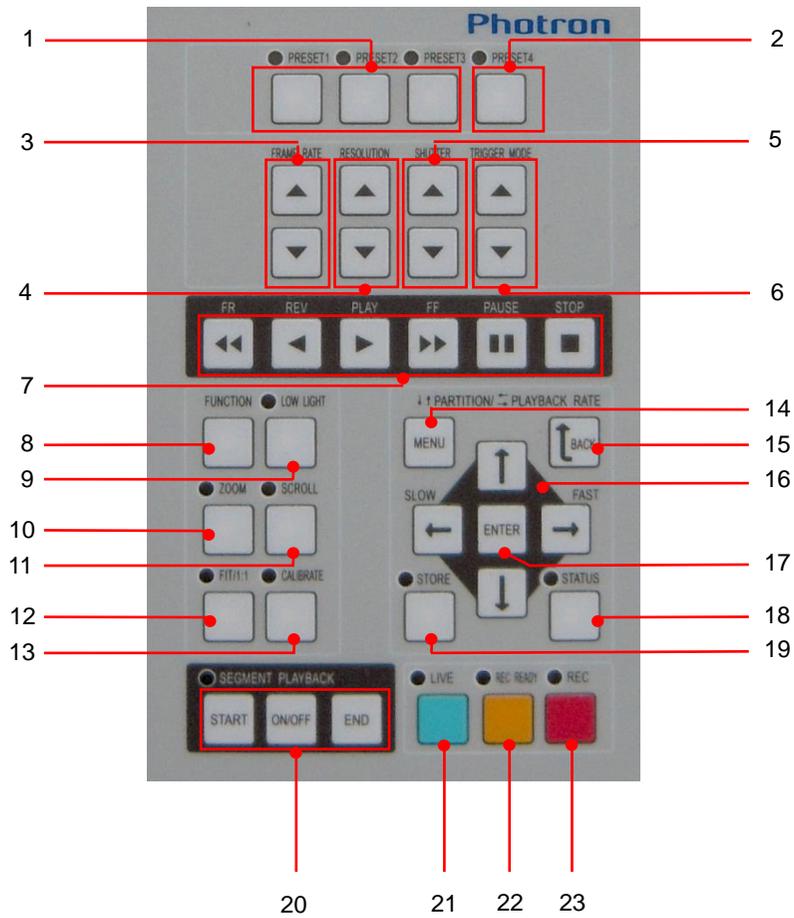
This section explains the basic Keypad operations necessary when recording with a high-speed camera.

2.3.1. Keypad

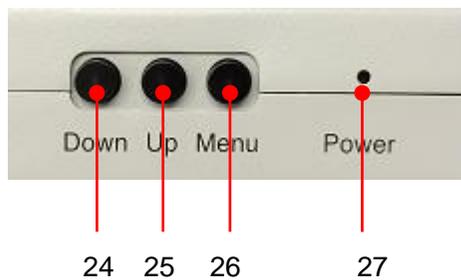
■ Keypad external view



■ Keys (on the Keypad front panel)



■ Buttons (on the LCD Monitor top)



Keys on the Keypad front panel

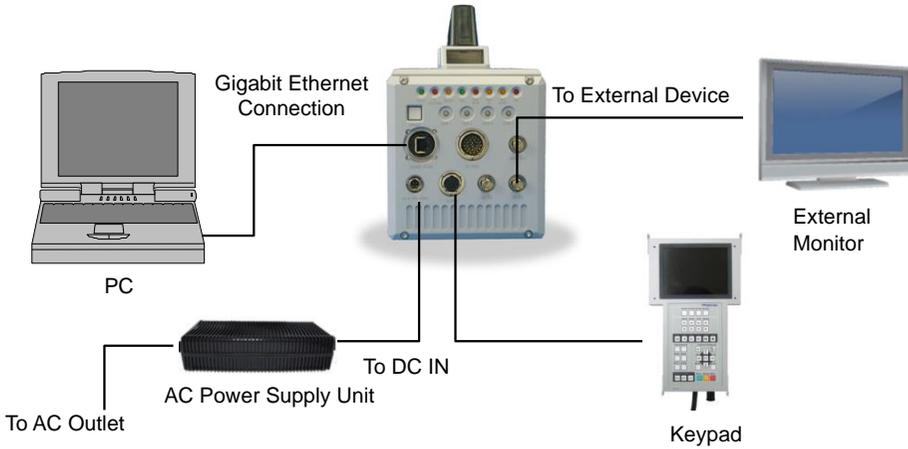
No.	Key Name	Function
1	PRESET	Access preset 1 to 3
2	PRESET SELECT	Access preset 4 Partition MODE3 Chang image(SA-X/X2/Z)
3	FRAME RATE	Frame rate setting
4	RESOLUTION	Resolution setting
5	SHUTTER	Shutter speed setting
6	TRIGGER MODE	Trigger mode setting
7	PLAYBACK	Playback controls
8	FUNCTION	Camera Head Select (MH4,MC) HD-SDI/VBS Select (SA1/1.1,SA4,SA5 and SA2)
9	LOW LIGHT	LOW LIGHT Mode
10	ZOOM	Zoom
11	SCROLL	Scroll
12	FIT/1:1	Fit monitor screen/1:1 display
13	CALIBRATE	Execute calibration
14	MENU	Menu display
15	BACK	Return from setting condition
16		Move up, down, left, or right
17	ENTER	Confirmation
18	STATUS	Status display
19	STORE	Store settings, store a marker
20	SEGMENT PLAYBACK	For segment playback
21	LIVE	Change LIVE/MEMORY
22	REC READY	Record ready
23	REC	Record

Buttons on the LCD Monitor top (see section 2.3.8)

No.	Button Name	Function
24	Down	Decreases the set value of LCD monitor setting.
25	Up	Increases the set value LCD monitor setting.
26	Menu	Displays the menu for LCD monitor setting.
27	Power	Switches power on/off for LCD monitor.

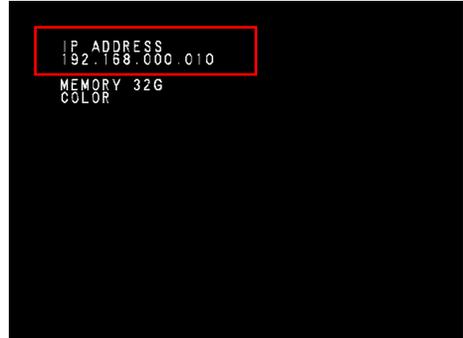
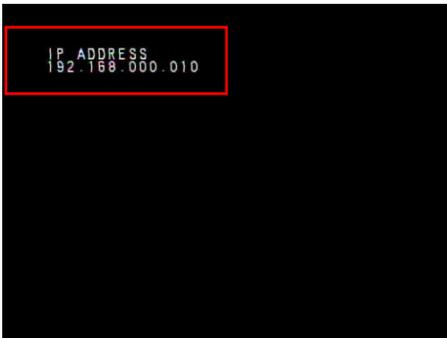
2.3.2. Startup Screen

- ① Refer to the hardware manual of the high-speed camera (separate manual) and finish connecting the cables, Keypad, and external devices. Then press the power switch on the high-speed camera body to turn on the power.

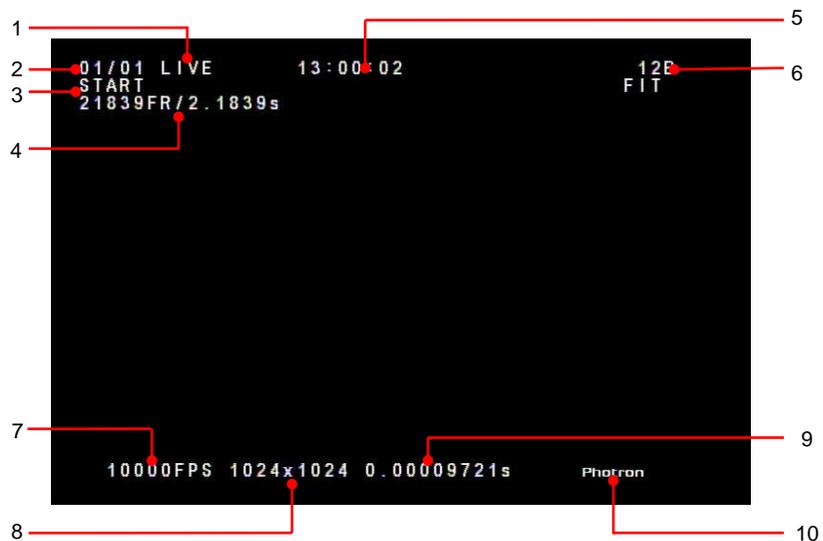


Example Cable/Device Connections

- ② When power is switched on, the current IP address setting is displayed as text in the upper left of the LCD monitor screen (for SA2, memory capacity and model name are also displayed).



- ③ After a short time, a screen like the one shown below is displayed.
- ④ The meaning of the text displayed on the screen is explained in the below table.



No.	Explanation
1	Current display mode (LIVE mode/MEMORY playback mode).
2	Currently used partition block and the number of configured partition blocks.
3	Current trigger mode.
4	Currently set recordable frame count and time (FR = frames, S = seconds)
5	Time/Date
6	Bit mode for recording (8 BIT or 12 BIT)
7	Current frame rate (FPS = frames/second)
8	Current resolution (pixels)
9	Current shutter speed (S = second).
10	Photron logo.

! Caution

- VIDEO (NTSC or PAL) and HD SDI signals cannot be output simultaneously at any given time. The unselected output channel, either VIDEO or HD SDI, will show color bars only.
- One same caption is displayed for either VIDEO or HD SDI signal that is being selected for output.

2.3.3. Displaying the Menu

The menu is displayed on the LCD monitor screen by pressing MENU on the Keypad.



Menu Screen

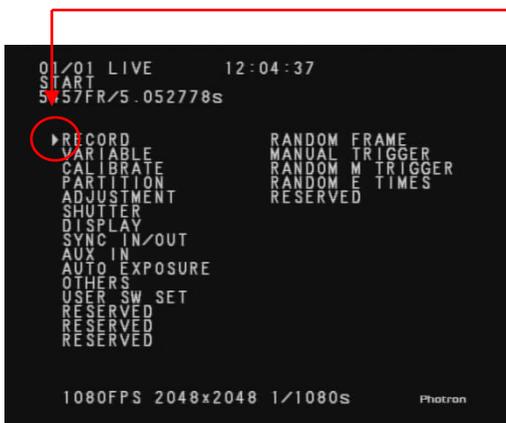
To exit the menu without making a selection or change, press MENU or BACK on the Keypad.

 Supplement

- Items displayed in the menu may vary from model to model.

2.3.4. Menu Selection/Confirmation/Cancellation

- ① The menu has a hierarchical structure made up of the "menu", "submenu", and "setting" layers, in that order. The cursor "►" on the menu can be moved and the necessary menu commands can be selected by pressing the ARROW keys on the Keypad.
- ② The procedure for selecting and changing an item to set is explained below.
- ③ Select an item on the menu using the ↑↓ (up and down) keys.



You can move the ► cursor by pressing the ↑↓ keys on the Keypad.

- ④ When you find the item you wish to set in the submenu (on the right), press the → (right arrow) key to move to the submenu. To return to the menu from the submenu, press the ← (left arrow) key.
- ⑤ Move to the item (in the submenu) you wish to configure using the ↑↓ keys, and press the ENTER key to set.
- ⑥ The configuration items will appear on the left side of the screen where the menu was displayed. Use the ARROW keys to change the setting as necessary. To return to the submenu from the configuration items, press MENU or BACK on the Keypad.
- ⑦ After changing the setting, complete your selection by pressing the ENTER key.

2.3.5. Saving Recording Settings

After using the procedure explained in "2.3.4. Menu Selection/Confirmation/Cancellation" to make or change settings, press STORE on the Keypad to save the settings for the frame rate, shutter speed, and resolution, which are explained in the camera's hardware manual (separate manual). The contents of the saved settings are retained in the camera's internal memory even when the power is off. However, use caution because the settings below are not saved.

- ZOOM setting
- FIT setting
- LOW LIGHT setting
- MENU -> DISPLAY -> KEYPAD setting

The following settings are saved every time the menu is switched, regardless of the status of setting.

- MENU->OTHERS->DIGITAL I/F SET setting
- MENU->DISPLAY->NTSC/PAL setting

2.3.6. Saving/Accessing Settings

Up to four configurations of settings can be saved. How to save/access such settings is explained next. For details on how to set recording conditions, refer to the high-speed camera's hardware manual (separate manual).

- ① On the Keypad, press one of the PRESET keys (1 to 4) you wish to set and save a configuration to.
- ② Configure the recording conditions of your choice. For how to configure the recording conditions, refer to the high-speed camera's hardware manual (separate manual).
- ③ Press the STORE key to save the settings. The current settings are saved to the PRESET key with the number you selected in the step one above.
- ④ To access the saved settings, press the numbered PRESET key that the settings were saved to.
- ⑤

Supplement

- When power is turned on, the system starts up with the preset configuration that was last saved.

2.3.7. Using Low Light Mode

The more you increase the frame rate or shutter speed of the camera, the less light enters the camera making the displayed image darker. Low light mode is a function that temporarily increases the exposure time in this kind of situation, to make the screen display easier to see. Press the LOW LIGHT key once to turn on low light mode. Press the LOW LIGHT key once more to clear low light mode. Pressing the REC READY key automatically clears low light mode and returns you to the selected frame rate and shutter speed.

When in low light mode, "LOW LIGHT" is displayed in the lower left of the screen.



! Caution

- The shutter speed can be changed in the Low Light mode and the change is saved. Note, however, the setting of this low light mode itself is not saved.

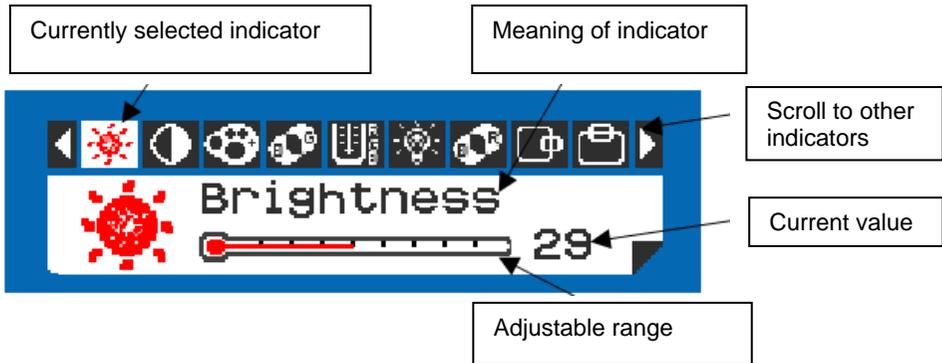
2.3.8. Setting LCD monitor

The buttons on the top of the LCD monitor allow you to set the monitor display conditions.

Press “Menu” to display the monitor setting window, and select an indicator to set.

“Up” and “Down” buttons set the value of the item shown by the indicator.

“Power” button will turn on/off the LCD.



Indicator	Meaning	Adjustable range
	Brightness	0-64
	Contrast	0-64
	Color	0-64
	Tint	0-32
	Sharpness	0-16
	Dimmer	0-9
	Color tone	Normal/Warm/Cool
	Mirror	OFF/ON
	Flip	OFF/ON

	H-Position	-25--+25
	V-Position	-10--+10
	Auto	
	Scan	Over Scan/Under Scan
	Information	See fig.1
	Setup	See fig.2
	Factory set	
	Exit	

Information display (examples)

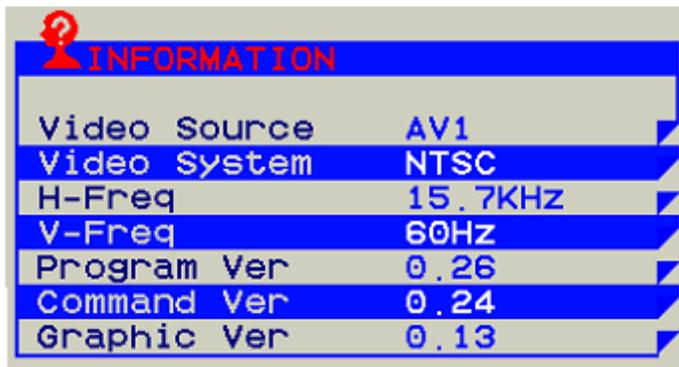


Fig.1

Setup menu – Select the Setup indicator and the below window appears:



Fig.2

Indicator	Meaning	Adjustable range	Function
	Show Status	ON/OFF Default : ON	Shows signal status.
	Blue Screen	ON/OFF Default : ON	Blue screen is displayed when no signal is present.
	Auto Power On	ON/OFF Default : ON	LCD monitor automatically turns on when the camera is powered on.
	Auto Saving	OFF/3s/5s/15s/30s Default : OFF	LCD monitor automatically turns off when signal is lost.
	Detect Source	ON/OFF Default : ON	Automatically detects signal source.
	Return (exit Setup menu)		

! Caution

- Generally, there should be NO need to change the setting of Setup menu items. Factory setting is strongly recommended for normal use.

Chapter 3. Recording/Playback Operations

3.1. Recording Video

3.2. Playing Video

3.3. Fast Forward & Rewind

3.4. Jog Playback (Single Frame Advance)

3.5. Enlarging & Shrinking the Playback Image (Zoom, Fit, Scroll)

3.6. Playing Segments of Interest

3.7. Playback Event Marker Function

3.1. Recording Video

You can easily record and save video by using the Keypad.

The way of operation differs depending on the set trigger mode.

The operations below also differ depending on the setting made under "4.4.3. Changing the Trigger Operation (RECORDING TYPE)".

Reference

- For more details, see "4.4.3. Changing the Trigger Operation (RECORDING TYPE)".

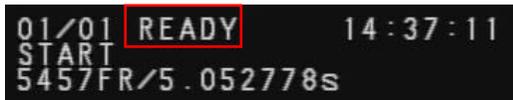
- For the START trigger mode

- ① Connect between the camera and LCD monitor and verify that the camera is in LIVE mode.



The LCD monitor displays the following information: "01/01" in the top left, "LIVE" in a red box in the top center, "14:34:12" in the top right, "START" in the middle left, and "5457FR/5.052778s" in the bottom left.

- ② Press REC READY on the Keypad to switch to the READY state (record ready).



The LCD monitor displays the following information: "01/01" in the top left, "READY" in a red box in the top center, "14:37:11" in the top right, "START" in the middle left, and "5457FR/5.052778s" in the bottom left.

- ③ Press REC on the Keypad to start recording.

When recording is made until the memory is full, the camera automatically stops recording and returns to LIVE state.

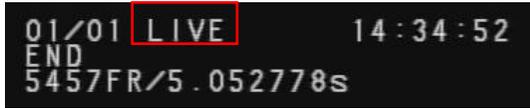
If you record until the memory is full, the camera returns to the live state.



The LCD monitor displays the following information: "01/01" in the top left, "REC" in a red box in the top center, "14:37:32" in the top right, "START" in the middle left, and "5457FR/5.052778s" in the bottom left.

- For the CENTER/END/MANUAL trigger modes

- ① Connect between the camera and LCD monitor, and verify that the camera is in LIVE mode.



01/01 LIVE 14:34:52
END
5457FR/5.052778s

- ② Press REC READY on the Keypad to switch to the READY state (record ready).



01/01 READY 14:36:49
END
5457FR/5.052778s

- ③ Press REC on the Keypad to start recording.

The display shows ENDLESS and the camera continuously records video.



01/01 ENDLESS 14:37:58
END
5457FR/5.052778s

- ④ Press REC on the Keypad again to end recording.

For CENTER/MANUAL mode, the video before and after the moment the REC key is pressed is saved. For END mode, the recorded video up until the moment the REC key is pressed is saved.

Reference

- For more details, see "4.1.1. RECORD".

- For the RANDOM/RANDOM RESET trigger modes

- ① Connect between the camera and LCD monitor, and verify that the camera is in LIVE mode.



- ② Press REC READY on the Keypad to switch to the READY state (record ready).



- ③ Press REC on the Keypad to enter the recording mode.

The display shows REC. Each time the REC key is pressed, the specified number of frames are saved. (In the case of below screen, 1000 frames are saved at each press of the key.)



- ④ When recording is made until the memory is full, the camera automatically stops recording and returns to LIVE state.

If you record until the camera's memory is full, the camera returns to LIVE mode and recording ends.

 Reference

- For details of how to set the number of frames to record, see "4.1.1. RECORD".

- For the RANDOM CENTER/RANDOM MANUAL trigger modes

- ① Connect between the camera and LCD monitor, and verify that the camera is in LIVE mode.
Connect the camera body and monitor and verify that the camera is in LIVE mode.



- ② Press REC READY on the Keypad to switch to the READY state (record ready).
Press the remote controller's REC READY key to switch to the READY state (record ready).



- ③ Press REC on the Keypad and the camera enters REC mode. The display shows ENDLESS.

Press REC, the display shows ENDLESS.



- ④ Press REC on the Keypad again and the camera gets in the REC state. The camera then records as many frames as set in advance, before and after the moment the REC key is pressed on the Keypad, and stops recording and returns to the ENDLESS state to wait for a subsequent trigger to come in.

For CENTER/MANUAL, the video before and after the REC key is pressed is saved. For END, the video up until the REC key is pressed is saved.



- ⑤ When you have recorded until the camera memory is full or the number of times to record set in the RANDOM E TIMES mode has been reached, the camera returns to LIVE mode. All this finishes one round of recording process.

If you record until the camera's memory is full or record until RANDOM E TIMES, the camera returns to LIVE mode and recording ends

Reference

- For details such as how to set the number of frames or times to record, see "4.1.1. RECORD".

3.2. Video Playback

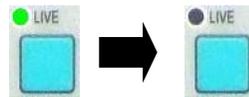
You can easily playback video by using the Keypad.

The method of playback differs depending on the set trigger mode.

- ① Switch from LIVE to MEMORY mode.

If the camera is in LIVE mode, press LIVE on the Keypad to switch to MEMORY mode.

When the camera switches to MEMORY mode, the LIVE key's LED turns off.



On the LCD monitor, you will see the camera has switched to MEMORY mode when the LIVE indication goes off.



- ② Press PLAY on the Keypad to start playback of the saved images.

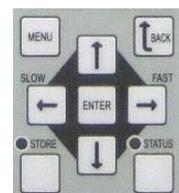


The other playback control keys are listed below.

Name	Function	Explanation
FR	Fast Reverse	Plays the recorded images in fast reverse at x10, x100, x1000 of the current playback speed. The fast reverse speed is changed in order with each press of the button.
REV	Reverse	Plays the recorded images in reverse at a playback speed of 2-30 fps (NTSC), 2-25 fps (PAL).
PLAY	Play	Plays the recorded images at a playback speed of 2-30 fps (NTSC), 2-25 fps (PAL).
FF	Fast Forward	Plays the recorded images in fast forward at x10, x100, x1000 of the current playback speed. The fast forward speed is changed in order with each press of the button.
PAUSE	Pause	Pauses playback. The II symbol is displayed in the upper part of the video output screen at this time. You can advance the frame by pressing the PLAY/REV keys in this mode.
STOP	Stop	Stops playback and returns to the trigger frame.

- ③ You can change the playback speed with the Keypad's ← → keys. The current playback speed is displayed in the upper portion of the screen.

PAL Playback Rates	2, 4, 8, 12, 25 fps
NTSC Playback Rates	2, 5, 10, 15, 30 fps



3.3. Fast Forward & Rewind

Set the camera to MEMORY mode.

- ① Press PLAY on the Keypad to start playing.



- ② You can play video in fast forward or fast rewind mode by pressing the FF (fast forward) or FR (fast rewind) key, respectively.



- ③ Each time you press the FF or FR key, you can change the playback or rewind speed in three steps, {x10, x100, x1,000}, in this order.

- ④ Press the PLAY key to return to the normal playback speed. Press the PAUSE key to stop playback and pause temporarily.



- ⑤ To restart playback, press PAUSE again.

3.4. Single Frame Advance

Set the camera to MEMORY mode.

- ① Display the part of video where you wish to use frame advance, and press the PAUSE key to pause there temporarily.



- ② In this state, by pressing the PLAY (playback) or REV (reverse) key, you can frame advance the video one frame at every press of the relevant key.
You can also frame advance the video in a ten-frame increments by pressing the FF (fast forward) or FR (fast rewind) key.

3.5. Enlarging & Shrinking the Playback Screen (Zoom, Fit, Scroll)

Photron's high-speed cameras use high-resolution sensors.

For this reason, depending on the specification of monitor, there may be portions of the video image that cannot be displayed when played as full format video.

Also, by increasing the recording speed or decreasing the resolution, there are situations where the played video on the screen appears extremely small.

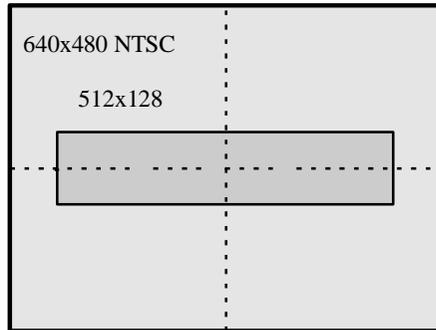
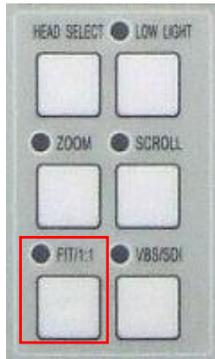
In these situations, use the "Fit" function to instantly shrink/enlarge the displayed video image to fit the normal resolution of the monitor screen.

Additionally, the image can be enlarged or shrunk by a desired zoom factor using the "Zoom" function, making it possible to verify details or look over the entire video image.

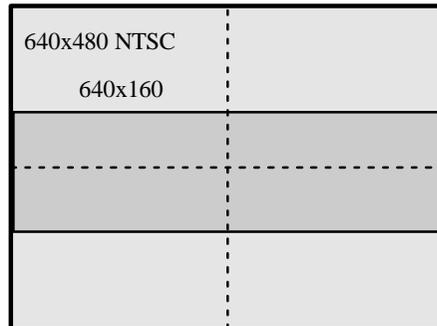
3.5.1. Screen Fit Display

Of the monitor output, the size of video image at different resolutions can be adjusted to fill the screen. This section explains an example of how a 512x128 pixel video image is fit to the NTSC monitor screen of 640 x 480 pixel resolution.

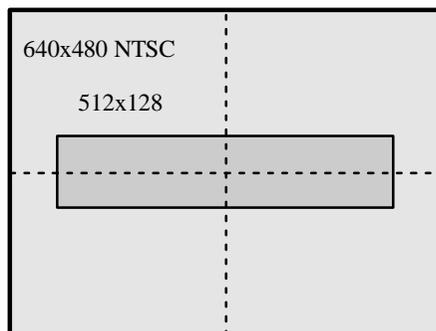
- ① Press the FIT/1:1 key on the Keypad.



- ② The displayed size of the image on the monitor screen changes and the recorded area is displayed at its maximum size of 640 x 160 pix resolution on the screen.



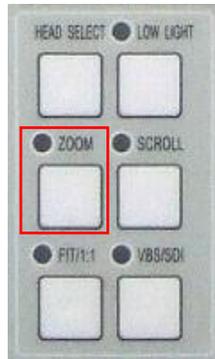
- ③ Press the FIT/1:1 key again to return to the original size.



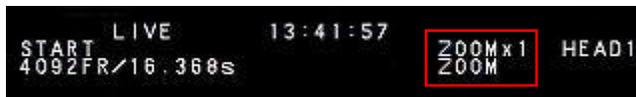
3.5.2. Enlarge Screen (Zoom) Display

This function displays the monitor output image enlarged (zoomed in).

- ① Press ZOOM on the Keypad.

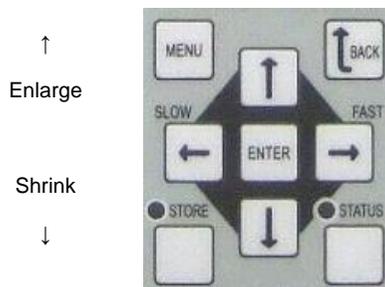


- ② The LED of the ZOOM key lights up. The ZOOM message and current zoom factor are also displayed on the monitor screen.



- ③ With the up and down ARROW keys, zoom in or out (enlarge or shrink) the displayed image.

The function maintains the position of the center of the displayed screen image while zooming in or out.



Supplement

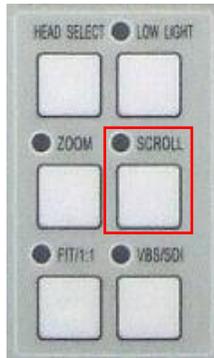
- Available zooming ratios (magnification factors) are x 1, x 2, x 4, x 8 and x 16

3.5.3. Scrolling the Enlarged Screen Image

You can scroll an enlarged image to display a desired part to take a close look at it.

- ① Press SCROLL on the Keypad.

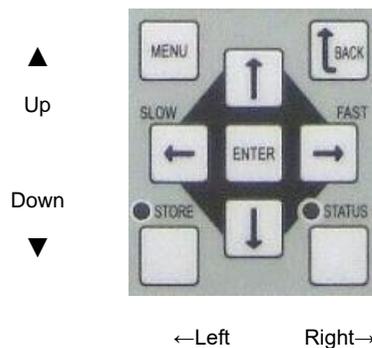
The LED of the SCROLL key lights up.



- ② The SCROLL message is displayed in the upper right of the monitor screen together with the current zoom ratio.



- ③ Scroll the screen image using the ARROW keys.



Supplement

- Scrolling is NOT possible when the full image is displayed filling the entire monitor screen.

3.6. Segment Playback

The playback of images recorded at high-speed takes an extraordinary long time. For example, a high-speed video of one-second duration recorded at 2000 fps takes 66 seconds to play back at the normal 30 fps of vide rate, in other words, a playback time of over one minute. In many cases, the range of images you wish to view is only a few out of the whole 2000 frames recorded.

Photron high-speed cameras have the segment playback function to playback only a selected range of images you wish to view by simply specifying the start and stop points of such a range.

This section explains how to use the segment playback function.

- ① Set the camera to MEMORY mode.
- ② Play the recorded video using the normal procedure.



- ③ Press the START key at the start point of a range of images you wish to view.



- ④ Press the END key at the end point of the selected range of images.



- ⑤ Press the ON/OFF key in the Keypad's SEGMENT PLAY BACK section and make sure the LED has lighted up. This has put the camera in segment playback mode.

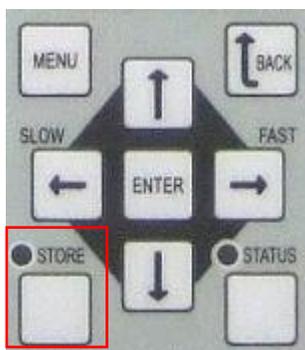


Playback operations will now take place only within the range specified by the start and end points.

3.7. Playback Event Marker Function

In MEMORY mode, you can pick and save 10 playback image frame numbers and immediately access, or jump to, any of those stored frame numbers (event marker frames). By marking the frames (up to 10) of your interest while the video is playing, you can easily recall any of such frames afterward using this convenient function.

- ① Set the camera to MEMORY mode.
- ② Playback the video using the normal procedure.
- ③ When a frame you wish to pick is displayed on the screen, press the STORE key.



- ④ Repeat steps 2 and 3 above. You can store a total of 10 points.
- ⑤ You can jump to any of the saved event marker frames using the up and down SHUTTER keys (▲▼).



When an event marker frame is displayed, "**MARKER FRAME x**" appears in the screen.
(Where x is a number from 1-10)

! Caution

- When saving a frame beyond the 10th point, such a point overwrites the point of the oldest frame number previously saved.



Chapter 4. System Settings

4.1. Function Settings

4.2. Network Settings

4.3. Display Settings

4.4. Other Detailed Settings

4.1. Common Function Settings

You can configure many of the functions related to recording by pressing the MENU keys on the Keypad. This section explains the function settings that are common to different camera models. For detailed instructions of how to configure your particular camera, see the Hardware Manual attached to it.

4.1.1. RECORD

This item configures the camera operation when using a specific trigger.

This setting has items like the ones shown below.



■ RANDOM FRAME

To use the RANDOM trigger mode, the number of frames to save each time the trigger is input must be set in advance before recording. For the RANDOM trigger operation, refer to the "Selecting the Trigger Mode" section of the camera's Hardware Manual.



• RANDOM FRAME

Sets the number of frames to record for each trigger. You can enter a value equivalent to the TOTAL FRAME or lower.

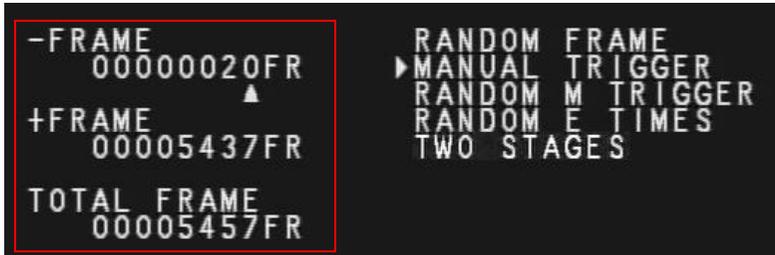
For example, by entering "1000FR",



"RANDOM 1000FR" is displayed on the screen. This indicates that 1,000 frames are recorded for each trigger input.

■ MANUAL TRIGGER

To use the MANUAL TRIGGER, you must set the number of frames to record before the trigger input. For the MANUAL TRIGGER operation, refer to the "Selecting the Trigger Mode" section of the camera's Hardware Manual (separate manual).

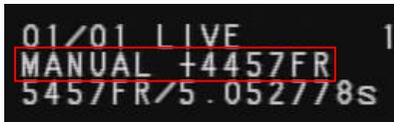


• -FRAME

Sets the number of frames to record before the trigger input.

The settable range is 0 to "TOTAL FRAME".

For example, by entering "1000FR",



"MANUAL +4457FR" is displayed on the screen. This is the +FRAME value which is the -FRAME value subtracted from TOTAL FRAME.

• +FRAME

Shows the number of frames to record after the trigger input.

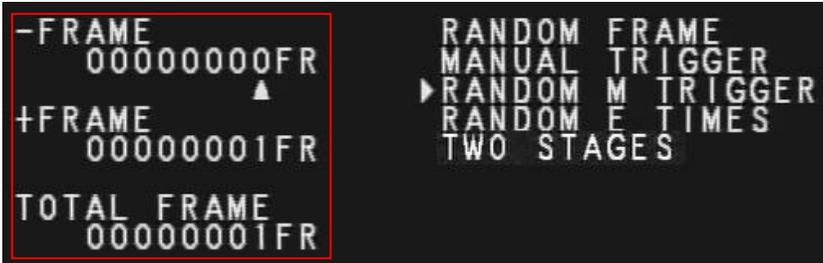
Only -FRAME can be set.

• TOTAL FRAME

Shows the total recordable frames according to the memory capacity and resolution of the currently used camera.

■RANDOM M TRIGGER

To use the RANDOM MANUAL TRIGGER, you must set the number of frames to record before and after the trigger input. For the RANDOM MANUAL TRIGGER'S operation, refer to the "Selecting the Trigger Mode" section of the camera's Hardware Manual (separate manual).



• -FRAME

Sets the number of frames to record before the trigger input.

• +FRAME

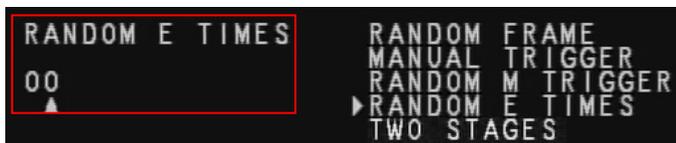
Sets the number of frames to record after the trigger input.

• TOTAL FRAME

Different than the RANDOM and MANUAL TRIGGERS, this does not show the total number of recordable frames, it shows the total of -FRAME and +FRAME.

■RANDOM E TIMES

When using the RANDOM CENTER and RANDOM MANUAL TRIGGERS, you can set how many times to record. For details of operation, refer to the "Selecting the Trigger Mode" section of the camera's Hardware Manual (separate manual).



• RANDOM E TIMES

Enter the number of times to record.

■ TWO STAGES

Using the TWO STAGES trigger mode, you can set to how many times the framing rate should be boosted when a trigger is entered. For details of the TWO STAGES trigger's operation, refer to the "Selecting the Trigger Mode" section of the camera's Hardware Manual (separate manual).



• TWO STAGES

You can set a target frame rate for the camera to be boosted to when a trigger is entered.

If the camera is set to 1/2 when the normal frame rate of 1,000 fps for example, the camera will be boosted 2,000 fps when a trigger is entered.

4.1.2. CALIBRATE

The CALIBRATE will calibrate the camera.



■Executing calibration

The procedure for executing calibration is explained below.

- ① Set the FRAME RATE and SHUTTER on the Keypad.
- ② Shield the lens using the lens cap. Since the black image at this time will be used as the correction reference, verify that the lens is completely covered so that no light is falling on the sensor.
- ③ Press MENU on the Keypad to display the menu.
- ④ Using the ARROW keys, select CALIBRATE, and then select CALIBRATE in the submenu.



- ⑤ With the $\uparrow\downarrow$ keys, move to ON, verify again that the lens is covered, and then press ENTER on the Keypad.
- ⑥ Calibration has finished with the above operation.
- ⑦ Remove the lens cap and verify that the image is displayed correctly.

You can also calibrate the camera in a much easier manner using the CALIBRATE key on the Keypad.

- ① Press the CALIBRATE key. The calibration menu is displayed on screen.
- ② Press the CALIBRATE key again, and calibration is done automatically.



Supplement

- ◆ With a camera equipped with a mechanical shutter system, the camera lens is automatically covered when calibration is executed, which makes it unnecessary for you to cover the lens manually.
- In order to obtain high-fidelity image output, it is highly recommended to execute calibration before recording whenever change is made on any of the following:
 - Frame rate
 - Shutter speed
 - Resolution

Also, depending on the settings, phenomena such as the following may occur.

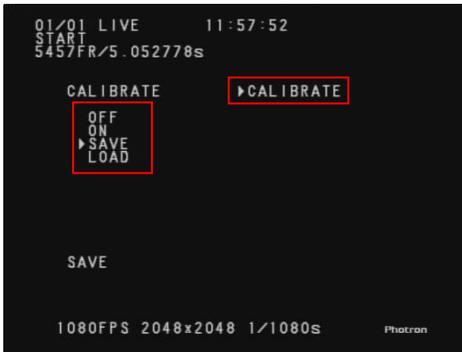
- Fixed noise, something like horizontal bands or lines, appears on the screen.
- Only one area of the screen shows a clear image, and all other areas are noisy.

These phenomena can be resolved by executing calibration again.

■Saving calibration setting data.

One set of the black image data produced as a result of executing calibration, and actually used for correction of image, can be saved in the camera. The procedure for doing this is explained below:

- ① Press MENU on the Keypad to display the menu.
- ② Using the ↑↓ keys, move the cursor to CALIBRATE.
- ③ Press ENTER key to select it.
- ④ Select SAVE with the ↑↓ keys, then press ENTER to save the data.



 Supplement

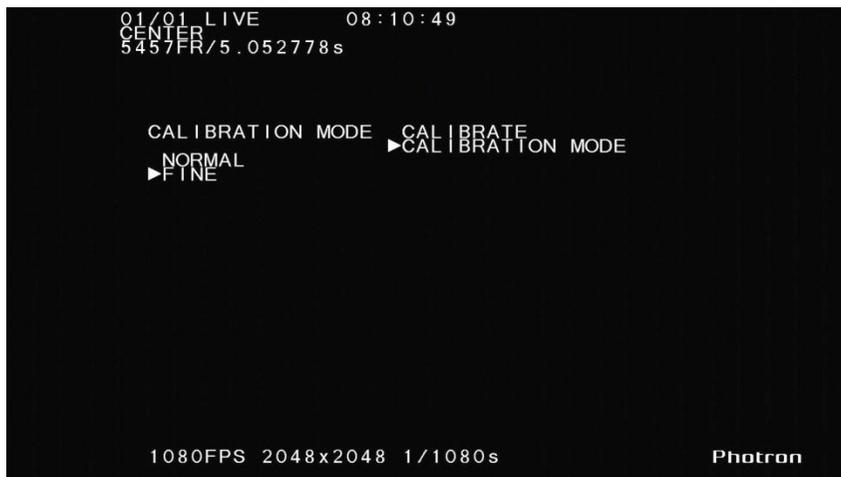
- The data saving process is sometimes time-consuming: it may take several tens of seconds to minutes.

■Loading calibration settings

- ① Press MENU on the Keypad to display the menu.
- ② Use the ↑↓ keys to move to CALIBRATE.
- ③ Press ENTER to select it.
- ④ Select LOAD item with the ↑↓ keys, then press the ENTER key.
- ⑤ The saved black image data for correction is loaded from internal memory and the output image reflects the correction.

■ Calibration mode option .

Only with some of the models having a special calibration functionality, the calibration method can be changed between two modes: NORMAL and FINE.



NORMAL: Calibrates using the NORMAL method as explained in the above.

FINE : Calibrates using the FINE method.

4.1.3. PARTITION

This item configures camera operation when saving image data in partitioned areas of the memory. This setting has items like the ones shown below.



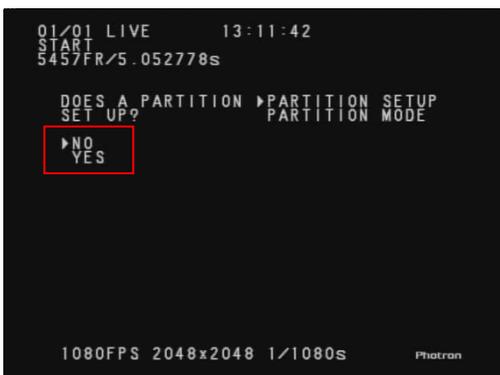
■ Memory partition setup

To use memory partitions, you must set up in advance how the memory should be partitioned. The procedure for settings is explained here.

- ① Press MENU on the Keypad to display the menu.
- ② Select PARTITION SETUP from the PARTITION submenu using the ARROW keys and press the ENTER key.



- ③ A prompt message to confirm whether or not you wish to configure partitions is displayed. To configure partitions, select YES. The setup menu is displayed.



- ④ Select the number of partitions you wish to make using the ARROW keys on the Keypad.
When finished, press the ENTER key to complete setting.
* Verify that the ID display on the screen has changed to the fraction display.

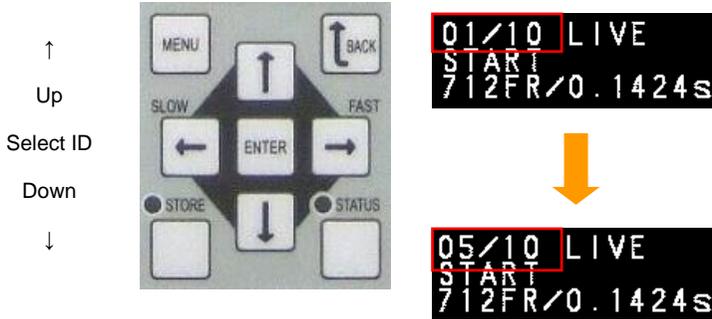


■Recording to a partitioned section

This section explains how to record in memory partition mode.

- ① Verify that the camera is in LIVE mode.
- ② Select the ID for section where you wish to record image data using the ARROW keys on the Keypad.

Verify the ID number displayed on the screen.

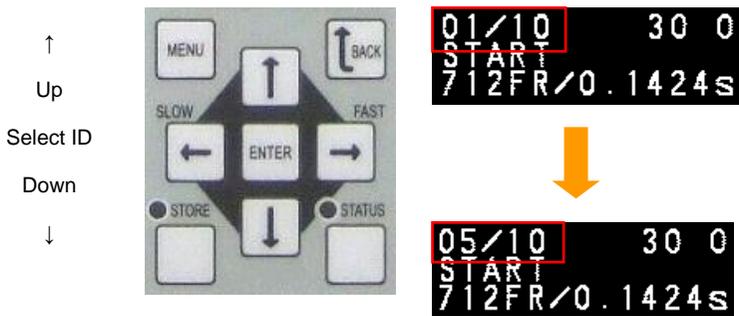


- ③ Once the section ID has been set, record image data into that partitioned section following the normal recording procedure.

■Playing image data recorded in a partitioned section.

The image data recorded in to each partitioned section can be played by selecting the section ID.

- ① Verify that the camera is in MEMORY mode.
- ② Select the section ID you wish to play using the ARROW keys. Verify the ID display on the screen.



- ③ When the section you wish to play is set, play it following the normal playback procedure.

■PARTITION MODE

You can configure the camera for recording in memory partition mode.

There are two or three modes depending on the model: MODE1, MODE2 and MODE3.

Some models have two modes ([MODE1] and [MODE2]) and other models have three modes ([MODE1]), ([MODE2]) and ([MODE3]).



[MODE1]: "Recording to a partitioned section" operation as previously explained (p. 39).

[MODE2]: After recording one scene, the recording automatically moves to the next partition.

[MODE3]: While replaying recorded video, the next recording can be done simultaneously into another partitioned section of the memory.

• Below description shows the operation in MODE2 when the partition count is 10.

- ① Select ID01 (see ■Recording to a partitioned section, page 46), and put the camera into the READY state
- ② Press REC on the Keypad to input a trigger to start recording.
- ③ After recording ends, the ID automatically changes to 02 and the camera waits for the next REC trigger input.
This means in START mode, the camera is in the READY state. In CENTER, END, or MANUAL modes, the camera is in the ENDLESS state.
- ④ Input the next REC trigger to start recording.
- ⑤ Recording ends.
- ⑥ The ID automatically changes to 03 and the camera waits for another REC trigger input.
- ⑦ Steps ②, ③, and ④ are repeated, until recording finishes with ID10, and then the camera returns to LIVE state.

This mode saves your trouble of manually moving to an ID and putting the camera into the trigger wait state, so it is better suited for consecutive recordings while changing partitioned sections of the memory.



Supplement

- MODE2 operation is valid only when in one of the below trigger modes:
START, CENTER, END, MANUAL



Reference

- For details of the function of "MODE3", refer to the "FASTCAM Hardware Manual".

4.1.4. ADJUSTMENT

This item configures the white balance adjustment, color enhancement function, LUT (look-up table) operation, and edge enhancement function.

This setting has items like the ones shown below.



■ COLOR TEMP (color models only)

Color models have the white balance adjustment setting. Two methods are available for adjusting the white balance, preset (fixed) and user-editable white balance.

• Using preset white balance

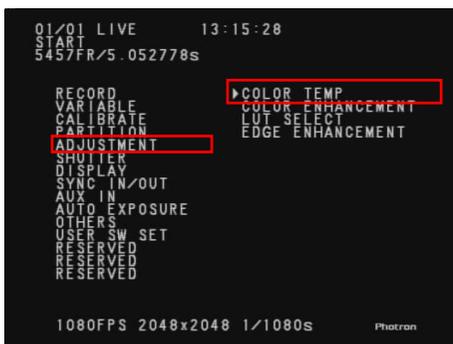
There are two types of white balance presets (5100K, 3100K) for use with common light sources.

The suggested color temperature and light sources for these presets are as follows:

5100K (daylight, outdoors)

3100K (halogen light source)

- ① Press MENU on the Keypad to display the menu.
- ② Select COLOR TEMP from the ADJUSTMENT submenu using ARROW keys and press the ENTER key.



- ③ Select 5100K (or 3100K, as appropriate) and press the ENTER key.
- ④ Verify that the white balance has changed to 5100K (or 3100K) on the screen.

• Using user white balance

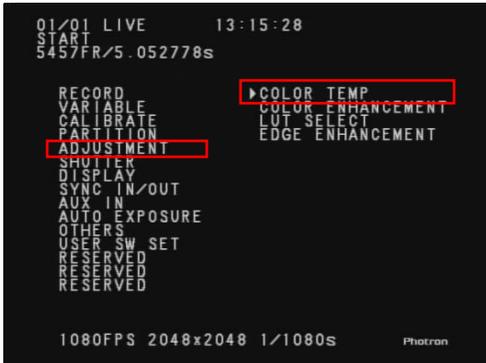
User white balance can be set in order to achieve the most appropriate white balance for the light source used and the environmental conditions during recording.

The values set here are stored in the camera's internal memory as the "User Preset" data, and they can be loaded by selecting USER1 (or USER2).

There are also two methods for setting user white balance, AUTO USER and EDIT USER. Each of these methods is explained here.

■ Configuring white balance by AUTO USER

- ① Set the desired conditions (frame rate, shutter speed, resolution) for recording.
- ② Press MENU on the Keypad to display the menu.
- ③ Select ADJUSTMENT, and then COLOR TEMP from the submenu using the ARROW keys and press the ENTER key.



- ④ Select AUTO USER1 or AUTO USER2 and press the ENTER key to get in the white balance adjustment mode.
- ⑤ Verify that a value similar to that shown below is displayed at the bottom left of the screen (not shown in the above screens).

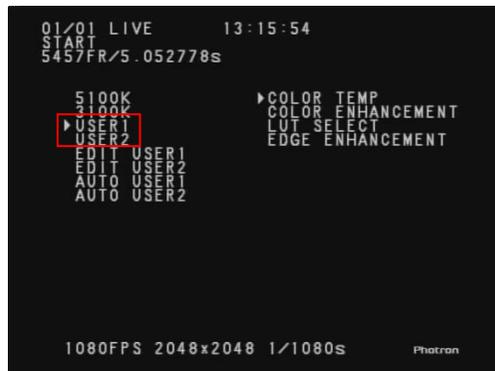


- ⑥ Turn on the lighting to be used for recording, and in the center of the screen, place a white sheet of paper for white reference.
- ⑦ Adjust the lens aperture and the light intensity. Verify that the value at the bottom left of the screen changes to the increase or decrease of the light amount entering the camera lens. If the brightness of the object on the screen apparently changes but the displayed value does not, replace the white reference object correctly in the center of the screen.

- ⑧ Continue adjustment of the light intensity until the DARK indication in the lower left of the screen changes to PUSH ENTER KEY. If the light intensity is too high, BRIGHT is displayed. Reduce the light intensity.



- ⑨ Press ENTER on the Keypad when PUSH ENTER KEY is shown.
- ⑩ The camera has now acquired an appropriate white balance value with this operation. Verify that the displayed image has been adjusted correctly.
- ⑪ The set value can be loaded by selecting USER1 or USER2.



Supplement

- AUTO USER1 is saved in USER1, and AUTO USER2 in USER2.

■ Configuring white balance by EDIT USER

EDIT USER allows the white balance to be set automatically and the user to adjust the tint by changing the RGB values manually. The value acquired by AUTO USER1 or AUTO USER2 can also be finely readjusted. This section explains how to configure the white balance using EDIT USER1 or EDIT USER2.

- ① Set the desired conditions (frame rate, shutter speed, resolution) for recording.
- ② Press MENU on the Keypad to display the menu.
- ③ Select ADJUSTMENT, and then COLOR TEMP from the submenu using the ARROW keys and press the ENTER key.



- ④ Select EDIT USER1 or EDIT USER2 and press the ENTER key. The white balance adjustment items are displayed.
- ⑤ Use the ARROW keys to set the RGB values. Press the ENTER key to confirm the settings when finished.



- ⑥ The set values can be loaded by selecting USER1 or USER2.

 Supplement

- EDIT USER1 is saved in USER1, and EDIT USER2 in USER2.

■ COLOR ENHANCEMENT (color models only)

Color models have a color enhancement setting functionality. The color enhancement level can be adjusted in five steps, including OFF.

- ① Press MENU on the Keypad, select ADJUSTMENT and then COLOR ENHANCEMENT from the submenu and press the ENTER key.



- ② The setting options are displayed. Each setting is described in the chart below.



Menu item	Description
OFF	Turns color enhancement mode off
LEVEL1	Sets x0.5 color enhancement
LEVEL2	Sets x1 (default) color enhancement
LEVEL3	Sets x1.5 color enhancement
LEVEL4	Sets x 2 color enhancement

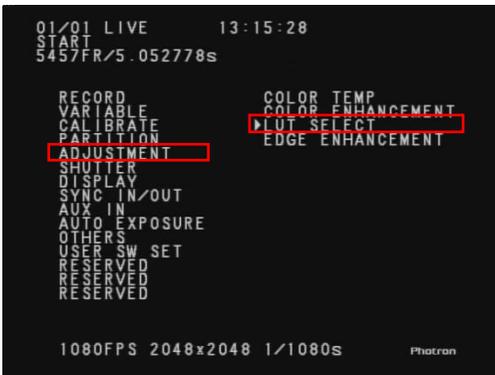
- ③ Use the ↑↓ keys to select one of the modes listed above. When finished, press the ENTER key to complete the setting.

■ LUT SELECT

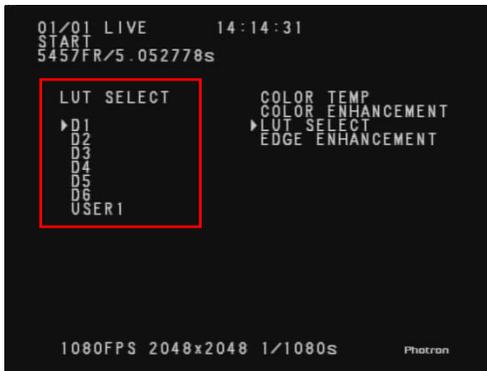
- Using preset LUT patterns

Six or Nine preset LUT patterns have been prepared in advance on the camera. This section explains about each of these patterns.

- ① Press MENU on the Keypad to display the menu.
- ② Select ADJUSTMENT, and then LUT SELECT from the submenu using the ARROW keys, and press the ENTER key.



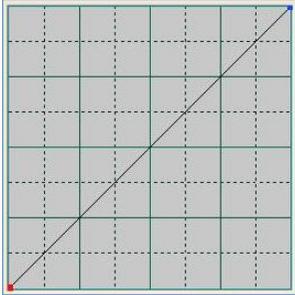
- ③ Select one of the items, D1 through D6, and its LUT setting is loaded.
(With SA2 / SA2 RV, items D1 to D9 will be displayed.)



■ For models other than SA2 / SA6

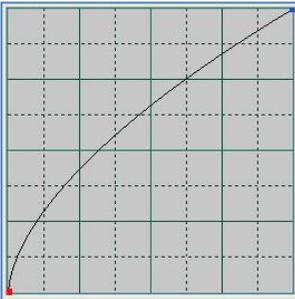
D1: Gain x1

The output is always linear with respect to the input. This LUT is used for normal operation.



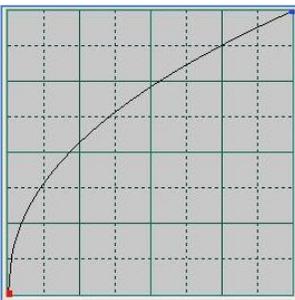
D2: Gamma 0.6

This LUT applies 0.6 gamma correction to the input signal.



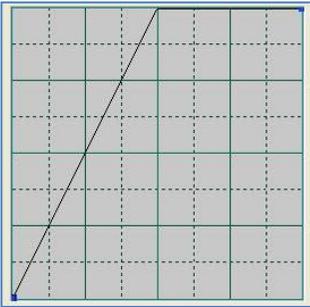
D3: Gamma 0.45

This LUT applies 0.45 gamma correction.



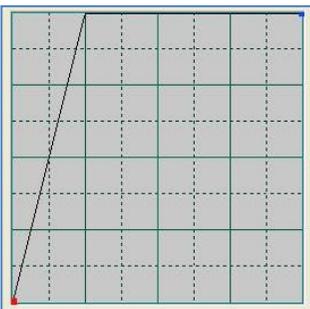
D4: Gain x2

The gain is doubled and dark areas in the image are emphasized.



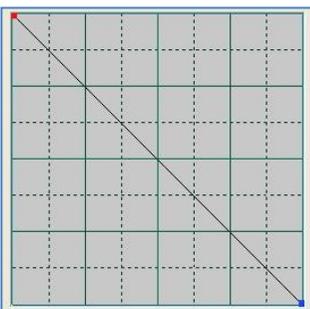
D5: Gain x4

The gain is quadrupled and dark areas in the image are further emphasized. This LUT emphasizes the dark portions even more than D4.



D6: Inverse

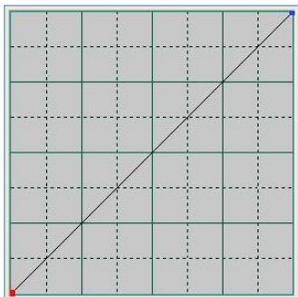
The input grayscale is inverted and then displayed.



■ For models SA2 / SA6

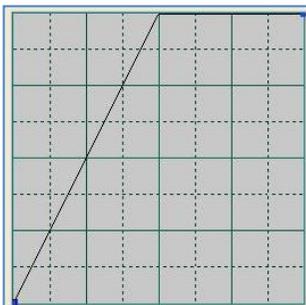
D1: Gain x1

The output is always linear with respect to the input. This LUT is used for normal operation.



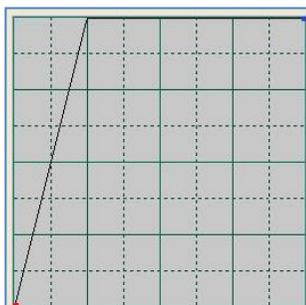
D2: Gain x2

The gain is doubled, and dark areas in the image are emphasized.



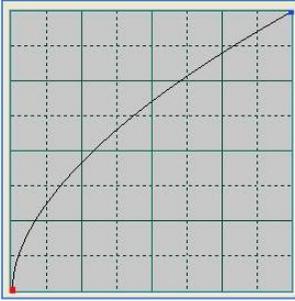
D3: Gain x4

The gain is quadrupled and dark areas in the image are further emphasized. This LUT emphasizes the dark portions even more than D2.



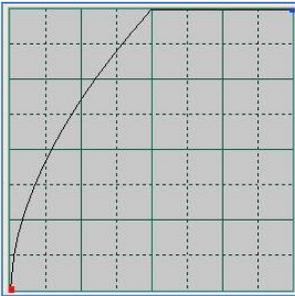
D4: Gamma 0.56

This LUT applies 0.56 gamma correction. This is the optimal gamma for MAC-series monitors.



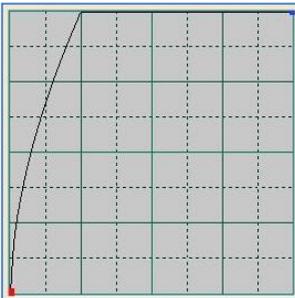
D5: Gamma 0.56 Gain x2

This LUT applies double gain at 0.56 gamma correction.



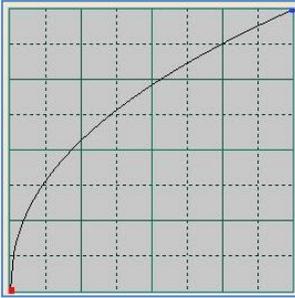
D6: Gamma 0.56 Gain x4

This LUT applies quadruple gain at 0.56 gamma correction



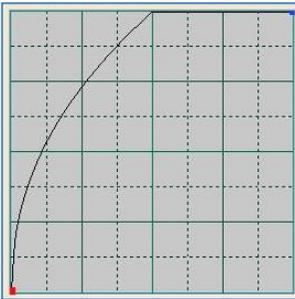
D7: Gamma 0.45

This LUT applies 0.45 gamma correction. This is the optimal gamma for video monitors.



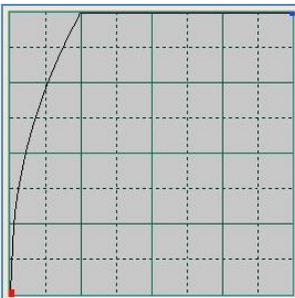
D8: Gamma 0.45 Gain x2

This LUT applies double gain at 0.45 gamma correction.



D9: Gamma 0.45 Gain x4

This LUT applies quadruple gain at 0.45 gamma correction

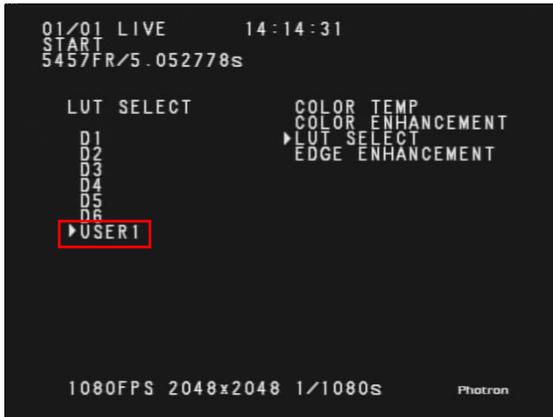


• **Custom LUT**

Creating a custom LUT pattern is done with Photron FASTCAM Viewer (PFV). A created custom LUT is saved in USER1. For details regarding creation and using a custom LUT, refer to the "Photron FASTCAM Viewer User's Manual".

■ **About USER1**

To use the custom LUT created with PFV, select USER1 in the LUT SELECT menu.



 Reference

- For details, refer to the "Photron FASTCAM Viewer User's Manual".

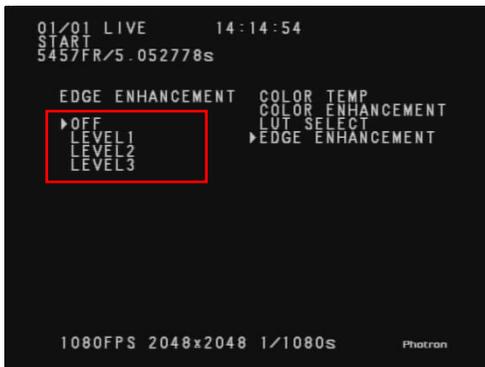
■EDGE ENHANCEMENT

You can enhance the edges of images in three levels of intensity using the camera's edge enhancement functions.

- ① Press MENU on the Keypad, and select ADJUSTMENT. Then select EDGE ENHANCEMENT in the submenu, and press the ENTER key.



- ② The setting items are displayed. Each setting is described in the chart below.



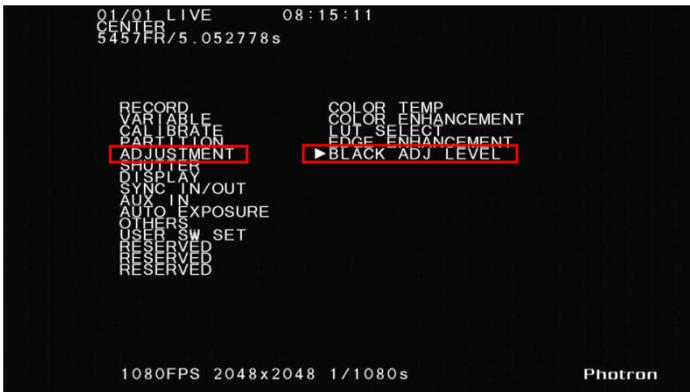
Menu item	Description
OFF	Edge enhancement off.
LEVEL1	Edge enhancement set to lowest level.
LEVEL2	Edge enhancement set to medium level.
LEVEL3	Edge enhancement set to highest level.

- ③ Use the ARROW keys to select one of the items listed above. When finished, press the ENTER key to complete the setting.

■BLACK ADJ LEVEL (for models SA2 / SA6)

With camera models provided with this function, eight black clamping levels are available to choose from.

- ① Press MENU on the Keypad to display the menu. Select ADJUSTMENT and then select BLACK ADJ LEVEL in the ADJUSTMENT submenu. Press the ENTER key to finish setting.



- ② The setting items are displayed. Each setting is described in the chart below.



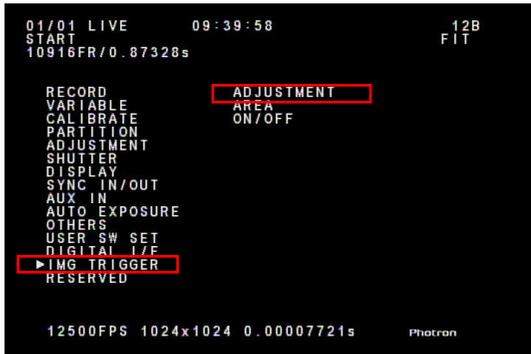
- ③ Use the ARROW keys to select one of the black clamping levels listed above. When finished, press the ENTER key to complete the setting.

4.1.5. IMAGETRIGGER

This section describes how to use the IMAGETRIGGER functionalities.

• Setting ADJUSTMENT

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys on, select IMG TRIGGER, and then ADJUSTMENT in the submenu. Press ENTER to finish setting.



- ③ Using the arrow keys, enter a value to set for REFERENCE and RANGE, respectively, and press ENTER to finish setting.

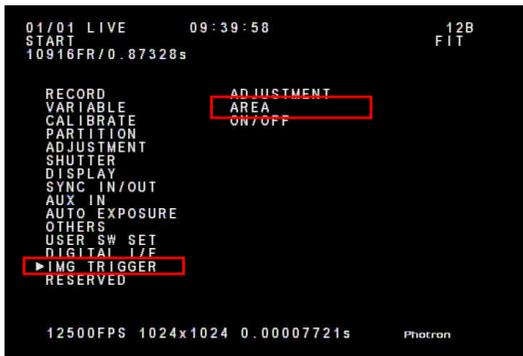


Supplement

- REFERENCE sets the reference value for the image level.
- RANGE sets a range for the reference value.

• **Setting AREA**

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys, select AREA in the IMG TRIGGER submenu and press ENTER to set.



- ③ Using the arrow keys, set POSITION and AREA, and then press ENTER to finish setting.

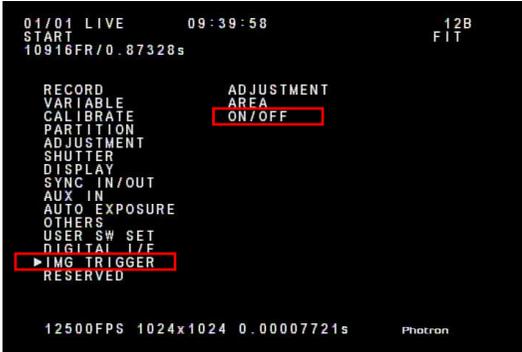


 **Supplement**

- AREA sets a range of level for the image output signal. Based on the average value of image output levels within the range set here, the triggering function is activated

• Setting ON/OFF switching function

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys on the Keypad, select ON/OFF in the IMG TRIGGER submenu, and press ENTER to set.



- ③ Using the arrow keys, select ON or OFF and press ENTER to set.



Menu	Description
OFF	Switches IMAGETRIGGER function OFF.
ON	Switches IMAGETRIGGER function ON.

 Reference

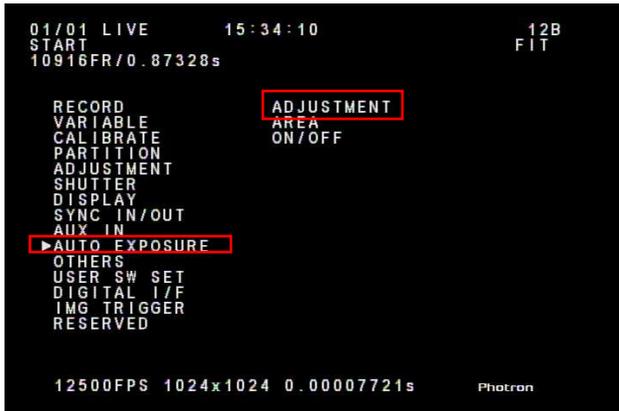
- For details, refer to the “FASTCAM Hardware Manual”.

4.1.6. AUTO EXPOSURE

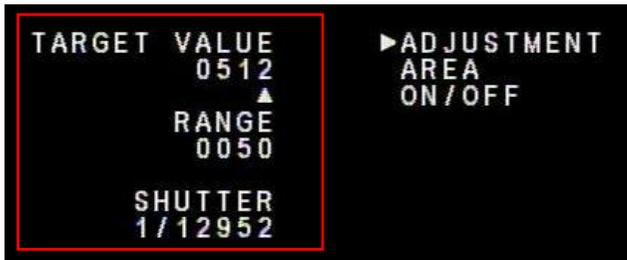
This section describes how to use the AUTOEXPOSURE functionalities.

• Setting ADJUSTMENT

- ① Press MENU on the Keypad to display the menu list.
- ② Using the arrow keys, select ADJUSTMENT in the AUTOEXPOSURE submenu. Press ENTER to set.



- ③ Using the arrow keys, enter a value to TARGETVALUE, RANGE and SHUTTER, and press the ENTER to complete setting.

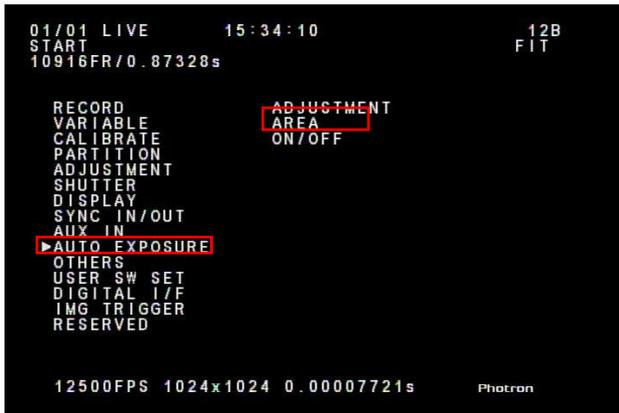


Supplement

- TARGETVALUE sets the desired level of image output signal.
- RANGE gives a range of value for the preset TARGETVALUE.
- SHUTTER sets the longest exposure time.

• Setting AREA

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow key, select AREA in the AUTOEXPOSURE submenu, and press the ENTER.



- ③ Using the arrow keys, set POSITION and AREA, and press the ENTER to complete setting.

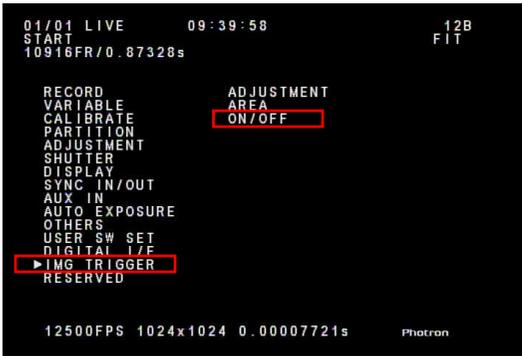


Supplement

- AREA sets a range of the level for the image output signal. The AUTO EXPOSURE so functions that the average value of the image output level within the set range can be retained at the desired image output level

• **Setting ON/OFF**

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys, select ON/OFF in the AUTOEXPOSURE submenu, and press ENTER.



- ③ Using the arrow keys, select ON or OFF and press ENTER to set.



Menu	Description
OFF	Switches AUTOEXPOSURE function OFF.
ON	Switches AUTOEXPOSURE function ON.

Reference

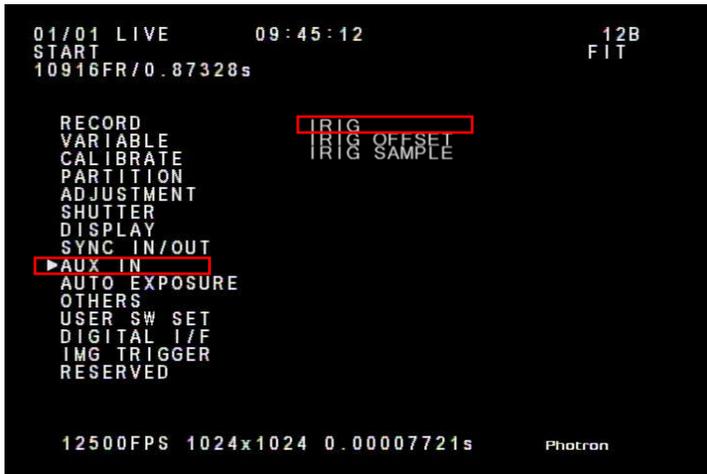
- For details, refer to the “FASTCAM Hardware Manual”.

4.1.7. IRIG Time Code

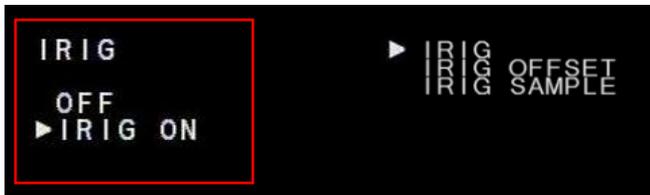
The camera system supports the IRIG-B time code and can add an IRIG code to each of recorded image frames.

• Setting IRIG ON

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys, select IRIG in the AUX IN submenu, and press ENTER.



- ③ Using the arrow keys, select IRIG ON and press ENTER to set.



• Setting IRIG OFFSET

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys, select IRIG OFFSET and press ENTER to set.

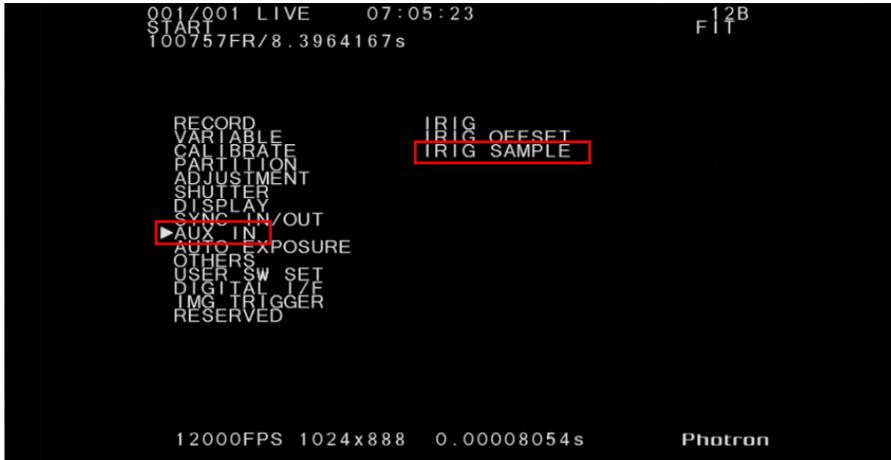


- ③ Using the arrow keys, enter a value to set, and press ENTER to complete setting.

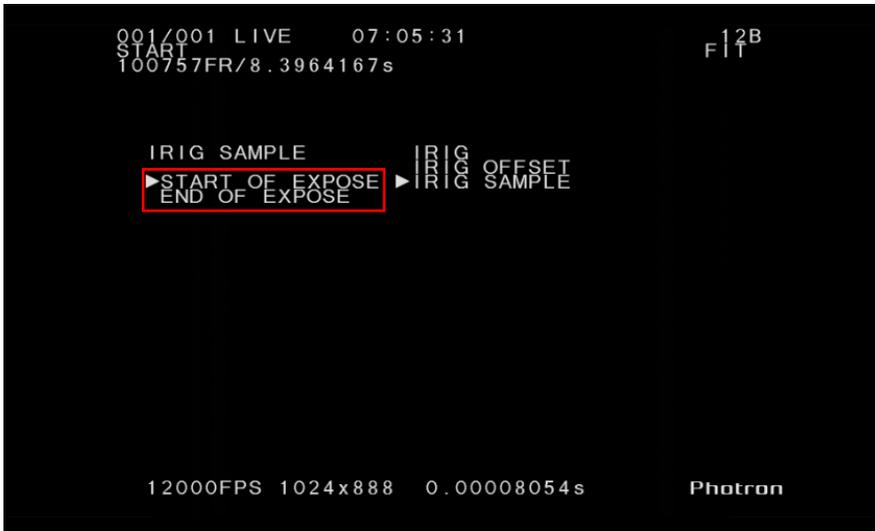


• **Setting IRIG SAMPLE**

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys, select IRIG SAMPLE in the AUX IN submenu, and press ENTER.



- ③ Using the arrow keys, choose the sample timing, and press ENTER to complete setting.



4.2. Network Settings

Photron high-speed cameras can be controlled from a PC via the Gigabit Ethernet interface. For how to operate the Photron FASTCAM Viewer software, refer to the "Photron FASTCAM Viewer User's Manual".

This section explains the required network settings when connecting a high-speed camera to a PC.

Supplement

- The default values of the high-speed camera's network settings are listed below.

IP ADDRESS > 192.168.0.10

NETMASK > 255.255.255.0

GATEWAY ADDRESS > 0.0.0.0

PORT > 2000 (fixed, not changeable)

4.2.1. Setting the IP Address

This section shows how to set the high-speed camera's IP address.

■ For a camera with one single port of Gigabit Ether connector

■ Configuration procedure

- ① Press MENU on the Keypad to display the menu.
- ② Select DIGITAL I/F SET from the OTHERS submenu with the ARROW keys and press ENTER.



- ③ Use the ARROW (← →) keys to move between digits and the ↑↓ keys to set the IP address.

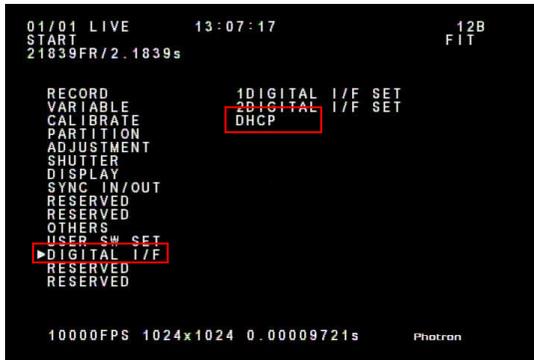


- ④ Press the ENTER key to confirm.

■ For a camera with two ports of Gigabit Ether connector

■ Configuration procedure

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys, select DHCP in the DIGITAL I/F submenu and press ENTER.



- ③ Select ON or OFF using the arrow keys.



- ④ Press ENTER to set.

- When OFF is selected, the IP address specified in the previous section [4.2.1 Setting the IP Address] becomes valid.
- When ON is selected, an IP address is acquired from the DHCP server and it becomes valid. If the camera is not currently connected to the DHCP server, an IP address will be acquired as soon as it is connected to the DHCP server. The acquired IP address is valid immediately. Moreover, the acquired IP address may be confirmed by the DIGITAL I/F SET menu. In this case, however, the IP address cannot be changed.
- When you wish to use the camera with DHCP on, set the IP address on the PFV to [Auto detection].



Caution

- Be sure that DHCP, when selected, is effective to both GIGABIT ETHER1 and GIGABIT ETHER2.
- Be also sure that DHCP cannot be made effective to only one of the two, either GIGABIT ETHER1 or GIGABIT ETHER2.



Reference

- For details, refer to the "Photron FASTCAM Viewer User's Manual".



Caution

- When you wish to connect two or more Photron cameras (Gigabit Ether I/F compatible) to one PC, you must use IP addresses that are different from each other. Also, when you wish to connect camera(s) to an existing network, never use IP address(es) that are already used in such a network.
- In addition, care must be taken so that the IP address of Gigabit Ether 1 and Gigabit Ether 2 should have a different value.

4.2.2. Using DHCP (Dynamic Host Configuration Protocol)

Photron high-speed cameras are DHCP compatible. In a network where DHCP is used, the high-speed camera's IP address can be acquired from the DHCP server.

- For a camera with one single port of Gigabit Ether connector

■ Configuration procedure

- ① Press MENU on the Keypad to display the menu-list.
- ② Select DHCP from the OTHERS submenu with the ARROW keys and press the ENTER key.



- ③ Select ON or OFF with the ARROW keys.



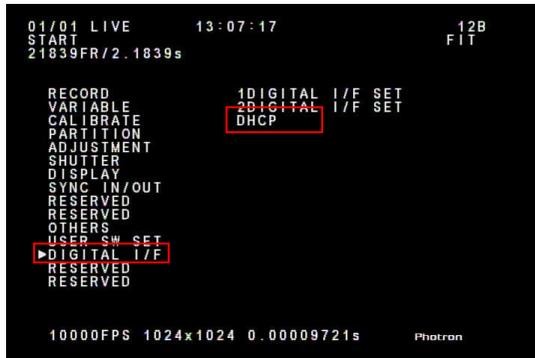
- ④ Press the ENTER key to confirm.

- When OFF is selected, the IP address specified in the previous section "4.2.1. Setting the IP Address" is valid.
- When ON is selected, the IP address is acquired from the DHCP server and that acquired IP address is valid. If the camera is not connected to a DHCP server, the IP address is acquired when a connection is made to the server. You can verify the acquired IP address with the DIGITAL I/F SET menu. In this situation, the IP address cannot be changed.
- When using the camera with DHCP on, set the IP address in PFV to "Auto detection".

■ For a camera with two ports of Gigabit Ether connector

■ Configuration procedure

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys, select DHCP in the DIGITAL I/F submenu, and press the ENTER key.



- ③ Select ON or OFF by the arrow keys.



- ④ Press the ENTER key to set.
- When OFF is selected, the IP address specified in the previous section "4.2.1. Setting the IP Address" is valid.
 - When ON is selected, an IP address is acquired from the DHCP server and it becomes effective. If the camera is not currently connected to the DHCP server, an IP address is acquired as soon as it is connected to the DHCP server. The acquired IP address is effective immediately. Moreover, the acquired IP address may be confirmed by the DIGITAL I/F SET menu. In this case, however, the IP address cannot be changed.
 - When you wish to use DHCP switched on, set the IP address on the PFV to [Auto detection].



Caution

- Be careful because DHCP is always effective on both Gigabit Ether 1 and Gigabit Ether 2.
- Be careful that DHCP cannot be made effective to only one of the two, either GIGABIT ETHER1 or GIGABIT ETHER2.



Reference

- For details, refer to the "Photron FASTCAM Viewer User's Manual".

4.2. Display Settings

Photron high-speed cameras display on the monitor many types of information about recording. This section explains about the display settings for displaying information on the monitor.

4.3.1 Switching the Date/Time Display

You can select either the date or time to be displayed on the screen. The procedure to display them is explained here.

- ① Press MENU on the Keypad to display the menu.
- ② Select DATE/TIME from the OTHERS submenu with the ARROW keys and press the ENTER key.
- ③ The DATE/TIME menu is displayed.



- ④ Select DATE or TIME with the $\uparrow\downarrow$ keys. The selected option is displayed on the screen.
- ⑤ When the setting is complete, press the ENTER key to finish.
- ⑥ Verify that the date or the time is displayed on the screen according to the setting.

Date Display Setting



Time Display Setting

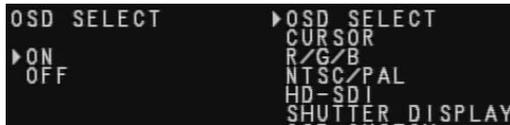


4.3.2. Show/Hide On-Screen Display Text (OSD SELECT)

- ① Press MENU on the Keypad to display the menu.
- ② Select OSD SELECT from the DISPLAY submenu with the ARROW keys and press the ENTER key.



- ③ Select ON or OFF with the ARROW keys. When ON, text on the screen is displayed. When OFF, no text is displayed on the screen.



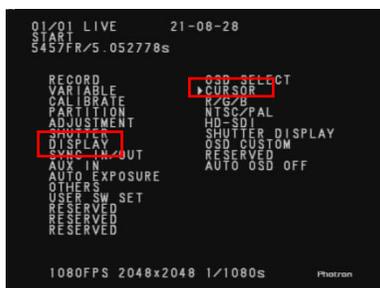
- ④ When the setting is complete, press the ENTER key to finish.
- ⑤ Verify that the screen's text display is ON or OFF.
You can also change the display with a single touch on the FUNCTION key.

4.3.3. Display Cross-hairs

This feature displays cross-hairs (a reference line or reticule) on the LCD monitor screen. The cross-hairs can be used to determine the position of an object within the image or as a pointing aid when viewing video playback.

Press MENU on the Keypad to display the menu.

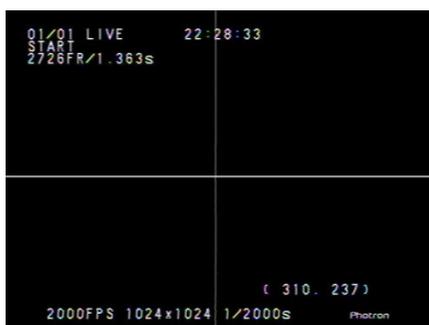
- ① Select CURSOR from the DISPLAY submenu with the ARROW keys and press the ENTER key.



- ② Select either OFF, ON1, or ON2 with $\uparrow\downarrow$ keys and press the ENTER key. Two types of cursors are provided, one with white lines (ON1) and black lines (ON2).



- ③ When ON1 or ON2 is selected, the cross-hairs (reticule) reference lines are displayed on the screen. At the same time, the coordinates of the center point of the cross-hairs are displayed on the screen.
- ④ The reference line can be moved to any position using the ARROW keys on the Keypad.





Caution

- Be aware that the cursor's coordinates are the coordinates for the VIDEO output screen display, not the coordinates of the actual image data.

For NTSC (VIDEO/SDI) output: X=0 to 639, Y=0 to 479

For PAL (VIDEO/SDI) output: X=0 to 759, Y=0 to 569

For HD SDI output: X=0 to 1919, Y=0 to 1079

4.3.4. Display the R/G/B Plane (Color Models Only)

- ① Press MENU on the Keypad to display the menu.
- ② Select R/G/B from the DISPLAY submenu with the ARROW keys and press the ENTER key.



- ③ Select the R, G or B plane to be displayed, or all of the RGB planes, with the $\uparrow\downarrow$ keys. Press the ENTER key to complete the setting.



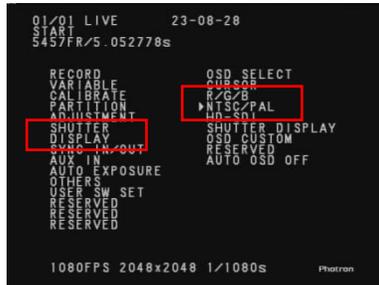
Supplement

- This functionality can be used on color models only

4.3.5. Switch the Video Signal Standard (NTSC/PAL)

This feature gives the high-speed camera a selection capability between video output signal formats, NTSC and PAL.

- ① Press MENU on the Keypad to display the menu.
- ② Select NTSC/PAL from the DISPLAY submenu with the ARROW keys and press the ENTER key.



- ③ Select NTSC or PAL with the $\uparrow\downarrow$ keys and press the ENTER key.



- ④ Cycle the power on the high-speed camera to enable the setting. The camera starts up with the newly selected video format activated.

Supplement

- The frequencies that can be set for HD SDI output change depending on the NTSC/PAL setting.
- For details, see "4.3.6. Changing the HD SDI Output Frequency".

4.3.6. Changing the HD SDI Output Frequency

You can change the HD SDI output frequency. The frequencies that can be set differ from format to format of the video signal, that is, NTSC or PAL.

- ① Press MENU on the Keypad to display the menu.
- ② Select HD SDI from the DISPLAY submenu with the ARROW keys and press the ENTER key.



- ③ Select desired item with the ↑↓ keys and press the ENTER key.



- ④ Cycle the power on the high-speed camera to enable the setting. The HD SDI output frequency changes and the camera starts up.

For NTSC	1080i	60Hz , 59.94Hz
	1080p	30Hz , 29.97Hz , 24Hz , 23.98Hz , 24Hz(sF) , 23.98Hz(sF)
For PAL	1080i	50Hz
	1080p	25Hz , 24Hz , 23.98Hz , 24Hz(sF) , 23.98Hz(sF)

Supplement

- Some frequencies may not be used depending on the camera model.

4.3.7. Changing the Shutter Speed Display (SHUTTER DISPLAY)

The OSD shutter speed display format can be switched between 1/xxxx s and 0.000000 s.

The 1/xxxx s display format seems clean because of its clear-cut looks. As far as the preciseness of the expressed length of time is concerned, however, 0.000000 s has definitely higher accuracy.

- ① Press MENU on the Keypad to display the menu.
- ② Select SHUTTER DISPLAY from the DISPLAY submenu with the ARROW keys and press the ENTER key.



- ③ Select 1/xxxS or 0.xxxS with the remote controller's $\uparrow\downarrow$ keys and press the ENTER key.

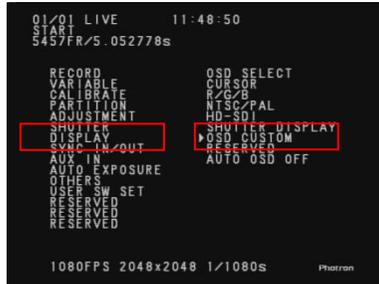


- ④ The display format on the LCD monitor is changed.

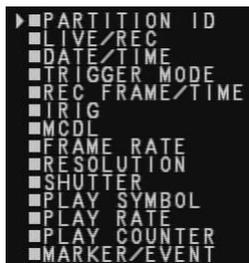
4.3.8. Individually Show/Hide On-Screen Display Text (OSD CUSTOM)

You can turn the entire on-screen display ON or OFF by OSD SELECT setting, but by OSD CUSTOM setting, you can individually turn any of the on-screen display elements ON or OFF.

- ① Press MENU on the Keypad to display the menu.
- ② Select OSD CUSTOM from the DISPLAY submenu with the ARROW keys and press the ENTER key.



- ③ With the $\uparrow\downarrow$ keys, select the item and show/hide with the $\leftarrow\rightarrow$ keys.
- ④ Items with a box (■) are displayed, which are the items to be SHOWN or HIDDEN.



- ⑤ Make a selection and the displayed items are changed.

4.3.9. Automatically Hide On-Screen Display Text (AUTO OSD OFF)

The on-screen display can be turned on or off with OSD SELECT. With AUTO OSD OFF selected, the on-screen display is automatically turned off during MEMORY data playback.

- ① Press MENU on the Keypad to display the menu.
- ② Select AUTO OSD OFF from the DISPLAY submenu with the ARROW keys and press the ENTER key.



- ③ Select ON or OFF with the ARROW keys. When ON is selected, the text is not displayed on the screen in MEMORY mode.



- ④ When the setting is complete, press the ENTER key to finish.
- ⑤ Verify that the on-screen's text display is ON or OFF in MEMORY mode.

Supplement

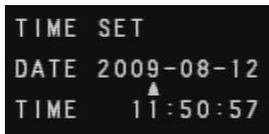
- Once OSD is turned off, that is, ON is selected for AUTO OSD OFF, OSD will not automatically resume its function of displaying information. If you wish to have on-screen information displayed, you must go back to the OSD SELECT menu to select OFF for AUTO OSD OFF again.

4.4. Other Detailed Settings

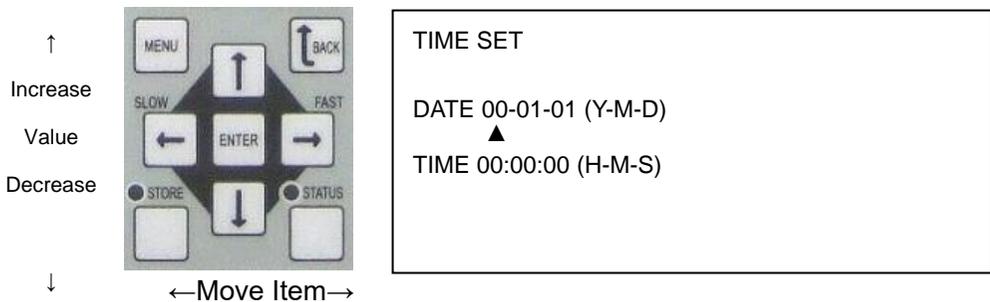
4.4.1. Setting the Date/Time

This option sets the high-speed camera's internal clock. Set the date and time correctly so it can be added as data to the recorded image. Once the date/time is set, the values are saved even when the system power is turned off the clock is battery-powered.

- ① Press MENU on the Keypad to display the menu.
- ② Select TIME SET from the OTHERS submenu with the ARROW keys and press the ENTER key.
- ③ The TIME SET settings are displayed on the left of the screen.



- ④ You can move between items with the ←→ keys and change the value with the ↑↓ keys.



- ⑤ When all the settings are complete, press the ENTER key to finish.

Supplement

- As for indication of the year, only the last two digits can be set. Indication on the monitor screen is limited to such two digits.

4.4.2. Post-Recording Auto-Playback Setting (AUTO PLAY)

Photron high-speed camera has a function that automatically switches the system, immediately after a recording is finished, from LIVE mode to MEMORY (playback) mode, while displaying the trigger frame (first frame of the recorded footage) and waiting for a playback command. You can use this function by setting AUTO PLAY to ON. This function is convenient for verifying the recorded video right after recording.

- ① Press MENU on the Keypad to display the menu.
- ② Select AUTO PLAY from the OTHERS submenu with the ARROW keys.



- ③ The menu to select the AUTO PLAY mode ON/OFF is displayed on the left side of the screen.

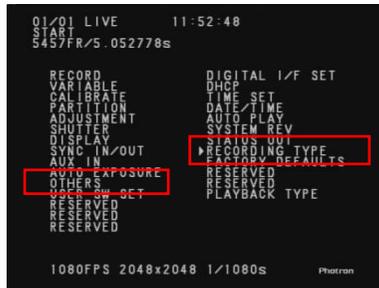


- ④ Select ON or OFF with the \uparrow/\downarrow keys. Press the ENTER key, then the MENU key to close the menu. The setting is complete.
- ⑤ In LIVE mode, perform a recording operation and verify that the system automatically switches to MEMORY mode after recording.

4.4.3. Changing Trigger Operation (RECORDING TYPE)

In normal recording, the READY key must be pressed to set the camera in the READY state, and then a REC trigger is input to start recording. By setting the high-speed camera to [Direct Trigger] type, however, the recording operation can be performed without even pressing the READY key. This way, you can reduce a step in the recording operation.

- ① Press MENU on the Keypad to display the menu.
- ② Select RECORDING TYPE from the OTHERS submenu with the ARROW keys.



- ③ Select either READY AND TRIG or DIRECT TRIG on the menu.



- ④ Press the ENTER key to finish setting.

- The operation mode of the high-speed camera for each item is shown below.
- **READY AND TRIG**

A READY key input is always necessary before a REC trigger is given for the camera to start recording.

(READY AND TRIG is the default setting)
- **DIRECT TRIG**

The recording operation can be started by giving a REC trigger only, without an advance READY key input.

The operation flow of Photron high-speed cameras to each trigger mode is shown below:

Items in italics show the camera's temporary state during a recording procedure, and [REC] shows a trigger input being given for the camera to start recording.

- **START and RANDOM modes**

[LIVE] → [REC] → *[READY]* → [REC] → *[REC]*
- **CENTER, END and MANUAL modes**

[LIVE] → [REC] → *[ENDLESS]* → [REC] → *[REC]*
- **DIRECT START**

When the camera system is set in the DIRECT START mode, with the CENTER, END or MANUAL trigger mode selected for recording, the camera gets in an endless (loop) recording mode at an entry of a [READY] key, after which the camera operates in the normal way of any of these three trigger modes.

4.4.4. Reset to the Factory Default State

You can reset the high-speed camera to the factory default state covering the frame rate, resolution, menu and all other items that can be set in the field.

- ① Press MENU on the Keypad to display the menu.
- ② Select FACTORY DEFAULTS from the OTHERS submenu with the ARROW keys and press the ENTER key.



- ③ Select CANCEL or RESET with $\uparrow\downarrow$ keys. CANCEL cancels the reset operation. RESET executes the system reset.



- ④ Press the ENTER key to confirm.

4.4.5. Loop Playback Setting (PLAYBACK TYPE)

With this feature you can select to play back video in a loop mode or otherwise when playing recorded image data in the MEMORY mode. Loop playback is on by default.

- ① Press MENU on the Keypad to display the menu.
- ② Select PLAYBACK TYPE from the OTHERS submenu with the ARROW keys.



- ③ The menu to select the PLAYBACK TYPE LOOP ON/OFF is displayed on the left side of the screen.

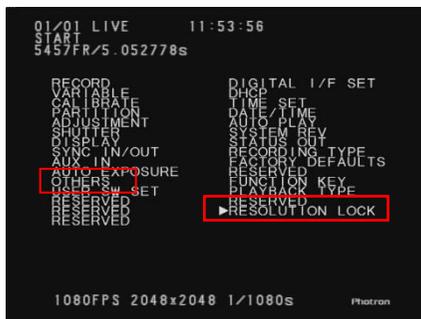


- ④ Select ON or OFF with the $\uparrow\downarrow$ keys. Press the ENTER key, then the MENU key to close the menu. The setting is complete.
- ⑤ Verify the loop playback operation by playing video in MEMORY mode.

4.4.6. RESOLUTION LOCK

Generally, when the frame rate is changed, the pixel resolution is automatically set to the maximum value allowable under the selected frame rate. With RESOLUTION LOCK feature selected for operation, however, the resolution is fixed to a specified value even if the frame rate is changed.

- ① Press MENU on the Keypad to display the menu.
- ② Select RESOLUTION LOCK from the OTHERS submenu with the ARROW keys.



- ③ The menu to select the RESOLUTION LOCK mode ON/OFF is displayed on the left side of the screen.



- ④ Select ON or OFF with the $\uparrow\downarrow$ keys. Press the ENTER key, then the MENU key to close the menu. The setting is complete.

4.4.7. Use of the FUNCTION Key

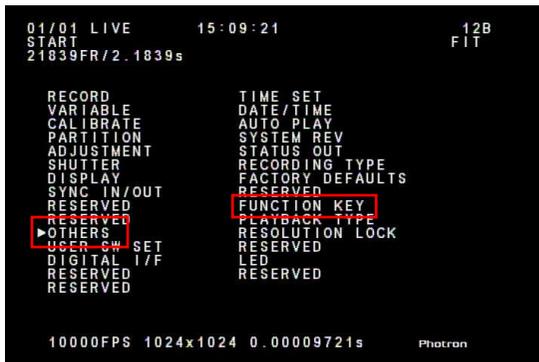
This section describes how to use the [FUNCTION] key.



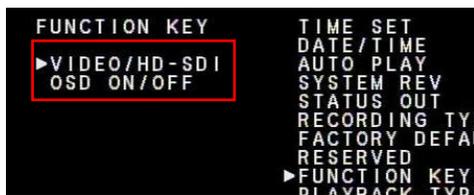
One of the following two functions may be assigned to the [FUNCTION] key:

1. Indication of switching between VIDEO and HD SDI
2. Switching between ON and OFF of OSD function

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys, select FUNCTION KEY in the OTHERS submenu.



- ③ FUNCTION KEY selection menu is displayed in the left of the monitor screen.



-
- ④ Using the up/down keys on the Keypad, select the function that you wish to set to the FUNCTION KEY. Press the ENTER key to set, and then the MENU key to exit the menu completing the setting procedure.

4.4.8. Display the System Revision

This option displays the system revision of your high-speed camera.

- ① Press MENU on the Keypad to display the menu.
- ② Select SYSTEM REV from the OTHERS submenu with the ARROW keys and press the ENTER key.



- ③ The system revision of your high-speed camera is displayed.



The high-speed camera model name, memory capacity, system revision, I/F version, and hardware version are displayed.

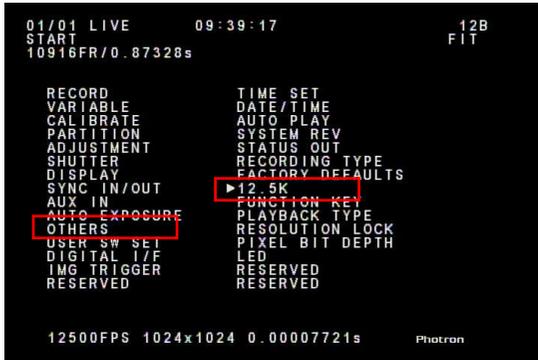
Supplement

- The information layout of the revision version display may be different from the above depending on when the camera was shipped.

4.4.9. Switching of framing rate modes

With some particular camera models, switching between two different framing rate modes is available for use. The following describes how to use this function:

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys, select 12.5K in the OTHERS submenu and press the ENTER key.



- ③ Using the arrow keys, set ON or OFF, and press the ENTER key to complete setting.



Menu display	Description
OFF	Operates in 10K mode.
ON	Operates in 12.5K mode.

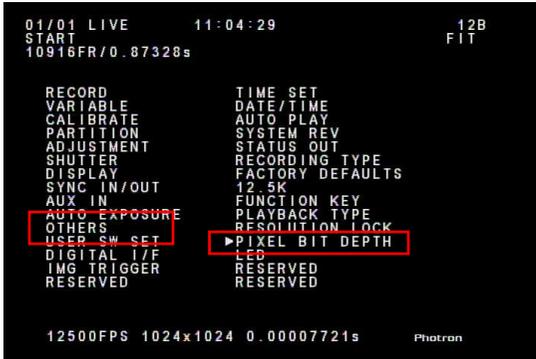
Reference

- For the frame rates that can be set for this mode on your camera, see the “High-Speed Camera Hardware Manual”.

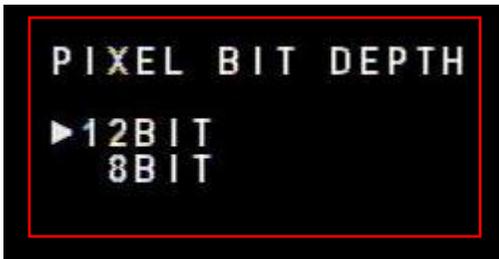
4.4.10. 8-bit framing mode (PIXEL BIT DEPTH)

With camera models that have a grayscale of 8 bits or higher, framing can be done while switching between 12 and 8 bits by changing the configuration. Here is the description of how to use such a function:

- ① Press MENU on the Keypad to display the menu.
- ② Using the arrow keys, select PIXEL BIT DEPTH in the OTHERS submenu, and press ENTER.



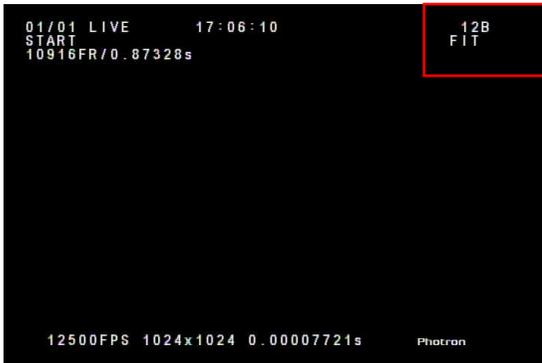
- ③ Using the arrow keys, select 12BIT or 8BIT, and press the ENTER key to set.



Menu display	Description
12BIT	Camera frames with 12-bit grayscale.
8BIT	Camera frames with 8-bit grayscale.

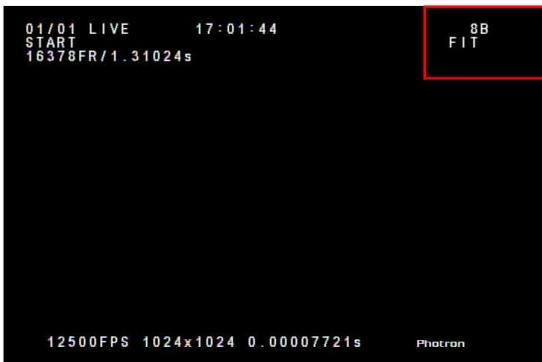
- **When in 12-BIT framing mode**

[12B] is indicated in the upper right corner as shown below.



- **When in 8-BIT framing mode**

[8B] is indicated in the upper right corner as shown below.



 Reference

- For details on the number of frames to be recorded and duration of recording, see the “High-Speed Camera Hardware Manual”.



Chapter 5. Product Specifications

5.1. General Specifications

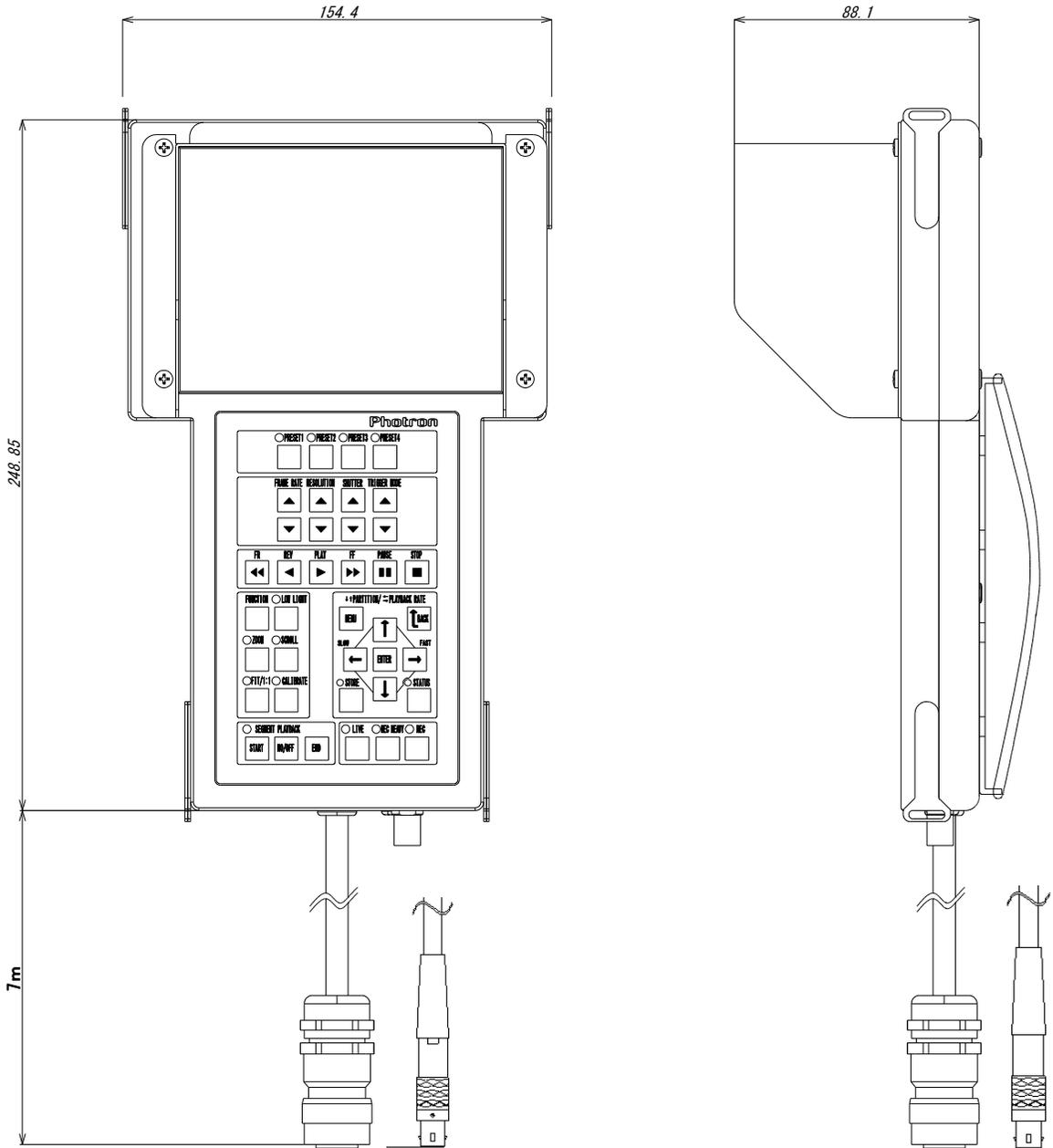
5.2. Dimensions

5.1. General Specifications

Environmental conditions	
Storage temperature	-20°C to 60°C (no condensation)
Storage humidity	85% or less (no condensation)
Guaranteed operating temperature	0°C to 40°C (no condensation)
Guaranteed operating humidity	85% or less (no condensation)
External dimensions	
Remote controller unit (Keypad)	248.85 (H) × 154.4 (W) × 28.3 (D) mm, excluding protrusions
Cable length	7 meters
Weight	
Remote controller unit (Keypad)	800 g
Keypad + cable	1.41 kg

5.2. Dimensions

(mm)





Chapter 6. Warranty

6.1. About the Warranty

6.1. About the Warranty

This system has been shipped having undergone testing. However, in the unlikely event that it malfunctions due to a manufacturing defect, it will be repaired, at no charge, within the warranty period.

When submitting the product for repair, be sure to attach the warranty card to the product. When shipping the product Photron for repair, the user is kindly asked to pay the shipping expense.

■Warranty Period

1 year from the day of purchase.

■Warranty Exceptions

The following exceptions will result in a fee-based repair, even within the warranty period.

- ① If the warranty card is not presented.
- ② If the warranty card is not completely filled with necessary information or any part of the information has been overwritten, or the name of the dealer is missing.
- ③ If the damage or malfunction was caused as a result of fire, earthquake, water damage, lightning, other natural disasters, pollution, or the effects of abnormal voltage.
- ④ If the damage or malfunction was caused as a result of dropping or mishandling during shipment or when moving after purchase or misuse.
- ⑤ Consumable goods (cables)
- ⑥ If repair, adjustment, or alteration has been made on the product by an entity other than Photron, or if the damage or malfunction is determined to be attributed to the user's faulty use of the product.

Reference

- For inquiries related to malfunction, contact the dealer where the product was purchased or Photron (see 7.1. Contacting Photron).

Chapter 7. Contacting Photron

7.1. Contacting Photron

7.1. Contacting Photron

For technical inquiries related to the product, or for inquiries related to the user's manual, telephone, FAX, or e-mail Photron, by using the contact information listed below. When calling, please ensure that you are dialing the correct number. Additionally, the following items will be verified when inquiring, so please have them ready in advance.

Items	Example
Contact information	Company name, customer name, telephone number, etc.
Product name	Remote Controller with LCD
Serial number	Check on the nameplate sticker.
Reason of inquiry	System conditions or whatever you know about it

Contact Information	
In Americas and Antipodes	PHOTRON USA, INC. 9520 Padgett Street, Suite 110, San Diego, CA 92126-4426, USA Phone: +1 (800) 585 2129 or +1 (858) 684 3555 Fax: +1 (858) 684 3558 E-mail: image@photron.com Web: www.photron.com
In UK, Africa and India	PHOTRON (EUROPE) LIMITED The Barn, Bottom Road, West Wycombe, Buckinghamshire HP14 4BS, U.K. Phone: +44 (0) 1494 48 1011 Fax: +44 (0) 1494 48 7011 E-mail: image@photron.com Web: www.photron.com
In Europe outside the UK	Photron Deutschland GmbH Ziegelweg 3, 72764 Reutlingen, Germany Phone: +49 (0) 7121 699 7950 Fax: +49 (0) 7121 699 7943 E-mail: image@photron.com Web: www.photron.com
In China	PHOTRON (SHANGHAI) LIMITED Room 20C Zhao-Feng World Trade Building, No. 369 Jiangsu Road Chang Ning District, Shanghai 200050, China Phone: +86 (21) 5268 3700 Fax: +86 (21) 5268 3702 E-mail: info@photron.cn.com Web: www.photron.cn.com
In other areas	PHOTRON LIMITED 21F, Jinbocho Mitsui Bldg., 1-105 Kanda Jimbocho, Chiyoda-Ku, Tokyo 101-0051, Japan Phone: +81 (3) 3518 6271 Fax: +81 (3) 3518 6279 E-mail: image@photron.co.jp Web: www.photron.co.jp

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