

User's Manual

High Speed Digital Camera System

MEMRECAM GX-3

Model MC-529

JAN 2010

nac Image Technology, Inc.

Introduction

The MEMRECAM GX-3 is designed to analyze images moving at speeds not visible to the naked eye.

The MEMRECAM GX-3 has a unitized configuration with an IC memory as the storage medium and so is a high speed digital camera that possesses the identical compact nature of a high speed film camera, the same immediate playback function of a high speed video camera, and can handle the digital data from all of the images after recording.

The MEMRECAM GX-3 easily performs the high speed photography necessary for high speed techniques. Photography and analysis without the use of a computer is possible with the included software containing the functions of remote operation from a computer with the simple operation of the included remote controller, image storage to a USB compatible external storage medium using the USB port and live image display using the viewfinder or monitor.

The MEMRECAM GX-3 is designed for high speed and superior image quality requirements. Photography at a resolution of 1280 x 1024 pixels is possible with a photographic speed of 1,500 frames per second. High speed photography is possible up to 198,000 frames per second (4(H) x 16(V)) using a split frame. Also, high speed image transmission to the control computer can be performed according to the high speed network (10BASE-T, 100BASE-TX, 1000BASE-T).

The MEMRECAM GX-3 performs high speed photography in demanding test environments, as well as possessing properties resistant to magnetism.

This user's manual provides the specifications, operating methods, interface with peripheral equipment and system expandability information to use the MEMRECAM GX-3 with these features.

Trademark

MEMRECAM is a registered trademark of nac Image Technologies, Inc.

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Read Before Using

Safety Precautions

To ensure safe use of this device, please completely read all of these following precautions before use. When using this device, the following symbols and warnings are displayed for areas where particular caution is necessary for safety. If there is a safety alert symbol within the description, please read the warning carefully before beginning operation. There may be unexpected problems due to conditions and circumstances of use of the device that are not listed below. Please carefully read all of the user's manual for the device. Directly contact the retail outlet if there are questions about this device.

DANGER

This indicates the existence of an imminently dangerous situation that could result in death or serious bodily injury to the user if the precaution is not observed.

WARNING

This indicates the existence of a potentially dangerous situation that could result in death or serious bodily injury to the user if the precaution is not observed.

CAUTION

This indicates the existence of a potentially dangerous situation that could result in slight bodily injury or moderate damage to the user if the precaution is not observed. This warning sign indicates a warning relating to faulty operation and the existence of areas where there is concern of damage to this device or connected devices.

Handling Precautions

Safety alert symbol

This is a 「Safety Alert Symbol」 .



This symbol is intended to alert the user of items or operations that could be dangerous to oneself or others during the use of this device. Carefully read the messages accompanying this symbol and follow the instructions to safely use this device.

Grounding terminal symbol



This symbol is displayed in areas with grounding terminals. If not grounded, electrical shock may occur when metal or other parts of the device are contacted. Do not ground, due to the dangers involved.

If a 3P-2P conversion plug is used to connect to the power outlet, connect the grounding wire of the conversion plug to the grounding terminal.

High voltage warning symbol



This symbol is displayed in areas of dangerously high voltage.

Remove the power cable from the outlet when replacing fuses.

Do not remove the cover of this device. Electrical shock could occur if this device is handled with the cover removed even if the power switch is OFF.

High temperature caution symbol



This symbol is displayed in areas of dangerously high temperature.

The device generates the heat and may become high temperature under energizing.

Don't touch the device as much as possible while operating. There is the danger of the burn.

Precautions for Use



Caution

Verify Power Input

Power input to the system should be AC 100~240V/47~63Hz when using the AC adapter (option), and DC20~32V when using DC power or batteries. Please verify power voltage, frequency and polarity prior to connecting to power.



Caution

Operating Environment

- Use in locations where the ambient temperature is 0~+40°C and the RH is 30~80%. Use where there is no condensation.
- Store where the ambient temperature is -10~+60°C and the RH is 20~80%. Store where there is no condensation.
- Avoid using in locations with smoke, corrosive gases or strong magnetism.
- Do not store in locations subject to direct sunlight, rain or salt water.
- Do not use in locations with excessive dirt, dust, sand or moisture.



Caution

Vibration and Shock

In MEMRECAM GX-3, there are no vibration and shock resistant properties requested by the collision experiment etc.

Please examine GX-1 etc. about use in such an environment.

**Caution****Handling the Main Camera Unit**

The inside of the main camera unit contains parts that are precisely manufactured and installed. Please keep the screws in the camera cover tightened and do not open the cover under any circumstances (even if the main camera unit does not operate properly). It may not be possible to recover the functions of the camera.

**Caution****Generation of Heat**

Heat will be generated during operation of the system but it will not interfere with operation. If an abnormal amount of heat is generated, turn off the power and unplug from the outlet. Directly contact the retail outlet or this company.

**Caution****Handling the Lens Mount**

Remove the lens or cap on the lens mount of the camera to view the camera contents. Do not touch or place items inside. This could damage the optical system, and any dust could adversely affect the image.

**Warning****Handling Cables**

Turn the power off while connecting or removing cables.
With the power still on, connecting or removing cables could result in a malfunction, or electrical shock.
Do not put metal parts into the connectors.

**Caution****Handling the Battery**

The MEMRECAM GX-3 is equipped with a standard memory backup battery so does not place in direct sunlight in vehicles, near fire, on the stove or any location with high temperatures.

The battery could leak and adversely affect performance of the battery of its life.

Do not use the memory backup batteries for any other purpose. The battery could leak, generate heat or malfunction.

Contact a retail outlet for replacement memory backup batteries.

**Caution****Handling When Moving or Transporting**

Use the special carrying case for this product when moving or transporting.



Caution

Amplification of Sensor Noise

The temperature of the image sensor used in this product alters the screen noise. This noise has a pattern that differs from the stationary pattern noise for each sensor.

In this product, noise reduction is performed by correcting the temperature changes as well as the stationary pattern noise for the sensor.

If a finer image quality is desired, adjust the black balance immediately prior to photographing.

Depending on the conditions and circumstances of use of the device, there may be malfunctions other than those listed above. Please carefully read all of the user's manual for the device. Directly contact the retail outlet if there are questions about this device.

Parts to be Replaced on a Regular Basis

- Clock Battery

The clock battery will last for approximately 8 years. Replacement cannot be made by the user so please contact the retail outlet or this company.

- Memory Backup Battery

Please replace the memory backup battery approximately one year after purchase. If the discharge rate accelerates or if there are differences in amount of use, please replace immediately. Replacement cannot be made by the user so please contact the retail outlet or this company.

Warranty

The warranty period for the MEMRECAM GX-3 is for one year after delivery.
For details, refer to the attached warranty.

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1

Overview

1.1 Standard Components

The MEMRECAM GX-3 high speed digital camera system consists of the following items as shown in Table 1-1.

Table 1-1 Standard Configuration

Descriptions	Model	Quantity
MEMRECAM GX-3 (Figure 1-1)	V-190	1
Conversion cable for viewfinder (Figure 1-2)	584888	1



Figure 1-1 MEMRECAM GX-3



Figure 1-2 Conversion cable for viewfinder

1.2 The Exterior of the MEMRECAM GX-3 & The Names and Functions of Each Part

The exterior of the MEMRECAM GX-3 is shown below (Figure 1-3, Figure 1-4).



Figure 1-3 The Exterior of the MEMRECAM GX-3 [I] (lens: NIKON 50 mm (sold separately))



Figure 1-4 The Exterior of the MEMRECAM GX-3 [II] (lens: NIKON 50 mm (sold separately))

1.2.1 Front Panel

The front panel of the MEMRECAM GX-3 is shown below (Figure 1-5).

The F mount adapter is secured to the front panel with four screws.

Caution When not using the MEMRECAM GX-3, use the mounting cap and do not leave the mounting aperture open. Please use caution to avoid letting dirt and dust inside the mount.

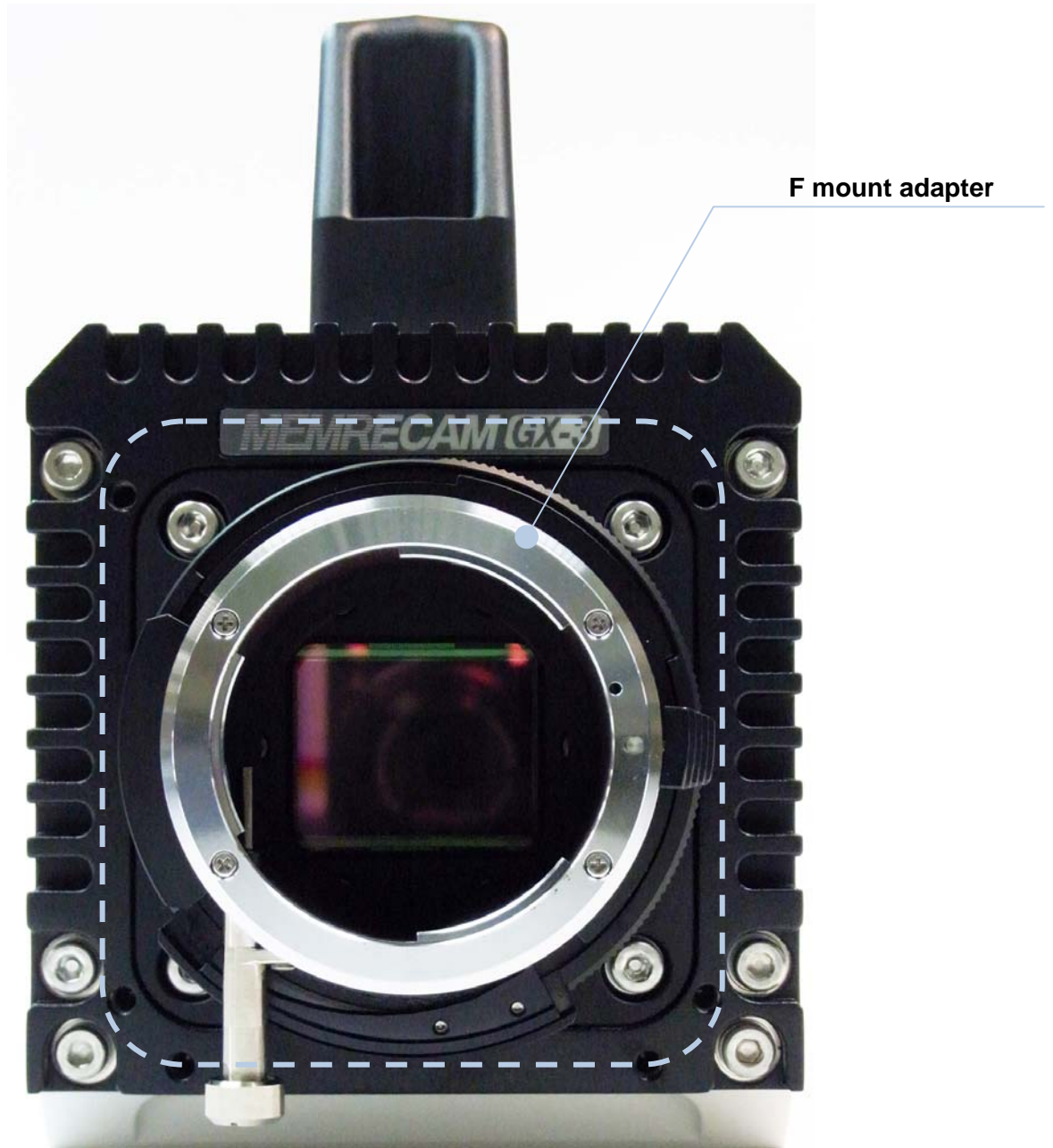


Figure 1-5 MEMRECAM GX-3 (Front Panel)

1.2.2 Lens Mount

The aperture ring is installed in the lens mount in MEMRECAM GX-3. (Figure 1-6)
This aperture ring is used by correspond the following.

Type of F mount lens

Lens without aperture ring

Stopping down the lens is adjusted with the mount aperture ring. However, please adjust it while confirming an actual image because the index of the mount is a rough guide.

Lens with aperture ring

Please turn the mount aperture ring to the conduct oneself that stops in the direction of CLOSE (The function of the mount aperture ring is released).

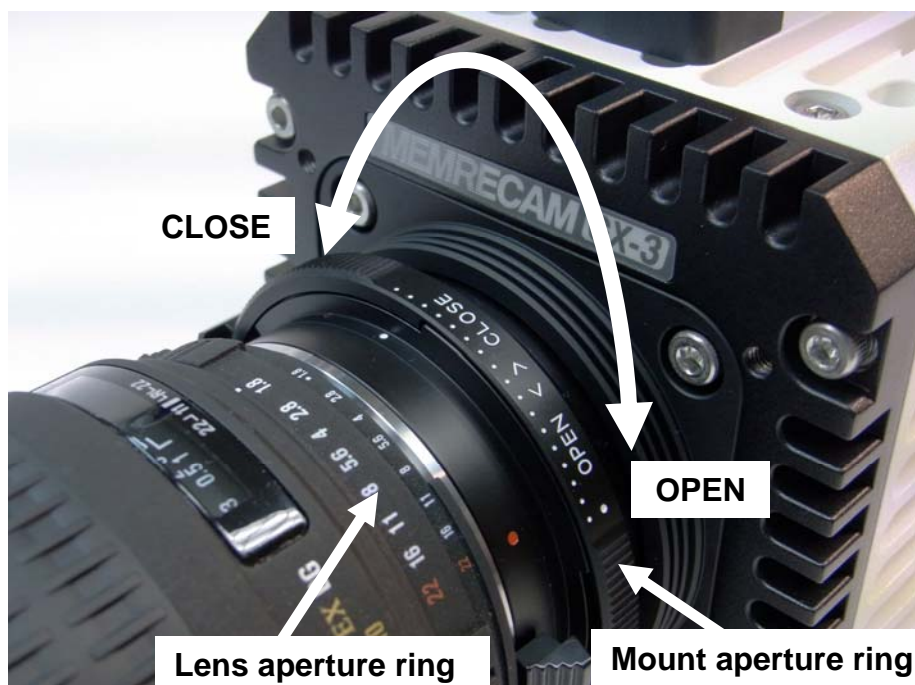


Figure 1-6 MEMRECAM GX-3 (Lens Mount)

(lens: SIGMA 24 mm (sold separately))

CAUTION When it is used by MEMRECAM GX-3, depending on representation resolution, vignetting may produce some F mount lenses. (Example: Nikon DX Nikkor Lens)

1.2.2 Rear Panel

The rear panel of the MEMRECAM GX-3 is shown below (Figure 1-7).

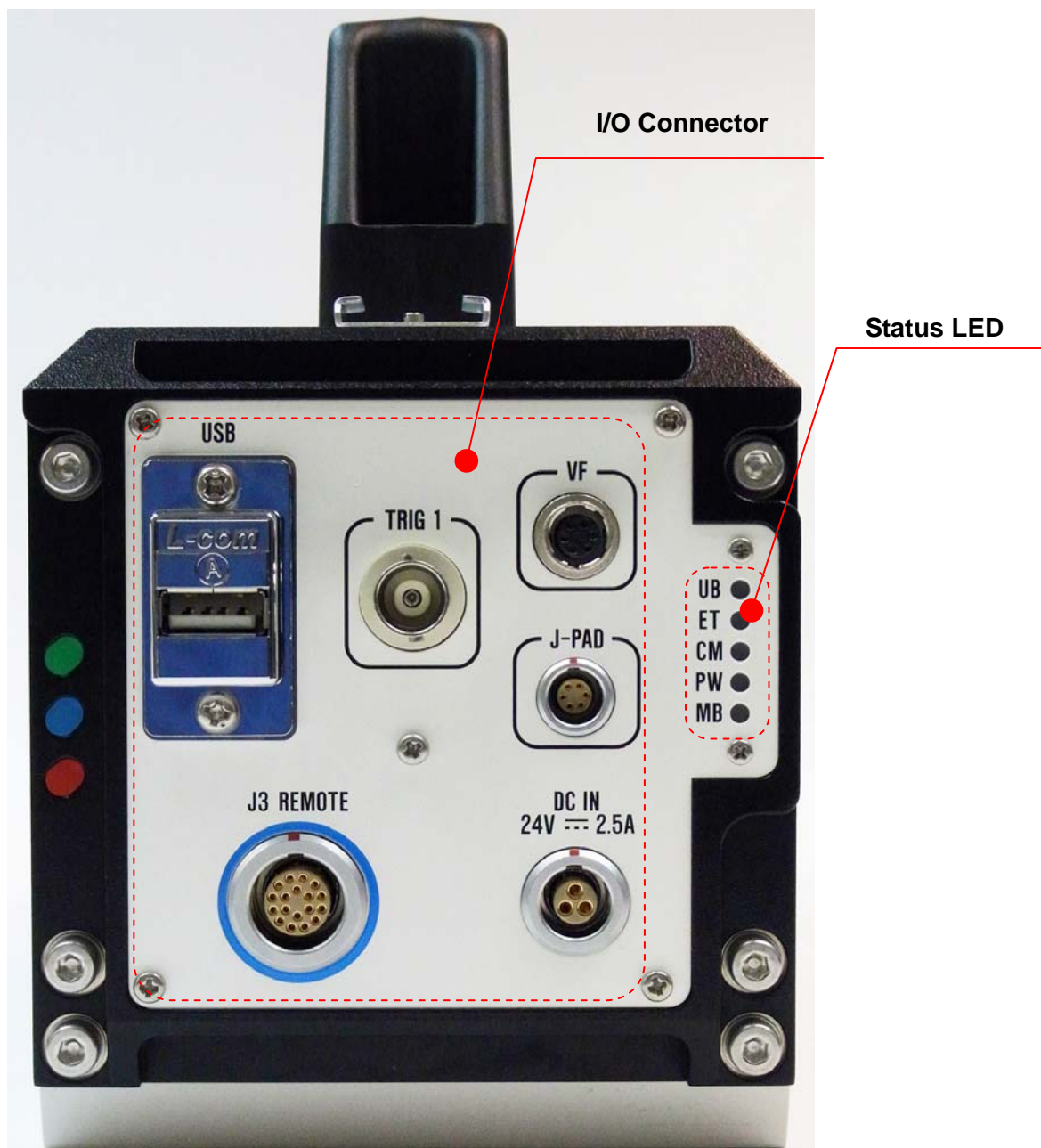


Figure 1-7 MEMRECAM GX-3 (Rear Panel)

1) Input/Output Connectors

There are three input/output connectors on the rear panel. Input/output signals and cable connections for each connector are shown below (Table 1-2).

Table 1-2 Input/Output Signals and Cable Connections

Name of Connector	Name of Branch Connector	Input/Output Signal
DCIN		Power input
J-PAD		RS232C (remote control JPAD3 connection)
		DC24V output (JPAD3 power)
TRIG 1		External trigger input (TRIG1)
VF		Video signal output
		DC24V output (VF power)
USB		USB (USB compatible storage media connection)
J3 (REMOTE) ID color: Blue	ETHER	Ethernet (control PC connection)
	TRIG2 ^(*1)	External trigger input (TRIG2)
	EST2 ^(*1)	Signal input to start exposure / event input (EST2)
	IRIG-B ^(*1)	IRIG-B time code input
	EPO ^(*1)	Exposure panel output (EPO)
	PWRCNT ^(*1)	Power control signal input

(*1) J3 branch cable (option) required.

2) Status LED

There are five status LEDs on the rear panel showing the status of the MEMRECAM GX-3. The color displayed for each LED and the flashing status changes according to the change in status. (Table 1-3).

Table 1-3 LED Status Display

LED Name	Display Color and Flashing Status	MEMRECAM GX-3 Status
UB (USB)	Lit green	Bus power supply
	Not lit	Bus power OFF
ET (ETHERNET)	Lit green	Connected to network
	Flashing green	Communicating with network
	Not lit	Not connected to network or Power OFF
CM (CAMERA MODE)	Lit blue	STOP mode
	Lit white	VIEW mode
	flashing white	VIEW mode (during EST synchronized signal recording)
	Lit magenta	ARM mode
	flashing magenta	ARM mode (during EST synchronized signal recording)
	Lit orange	REC mode
	flashing orange	REC mode (during EST synchronized signal recording)
	Not lit	Power OFF
PW (POWER)	Lit green	Power ON (normal status)
	Lit red	Power ON (fail status ^(*))
	Not lit	Power OFF
MB (MEMORY BACKUP) (*2)	Lit green	Valid memory backup, Charge: High (backing up with external power)
	Flashing green	Valid memory backup, Charge: High (backing up with battery)
	Lit orange	Valid memory backup, Charge: Medium (backing up with external power)
	Flashing orange	Valid memory backup, Charge: Medium (backing up with battery)
	Lit red	Valid memory backup, Charge: Low (backing up with external power)
	Flashing red	Valid memory backup, Charge: Low (backing up with battery)
	Not lit	No memory backup data

(*1) Fail status: During MEMRECAM GX-3 operation, indicates a malfunction detected, an abnormal power voltage detected or an increase in the sensor temperature detected.

(*2) The charge amount is impacted by differences in batteries and the ambient temperature, and is not precisely displayed.
Use only as a guide.

3) Battery Case

There is a memory backup battery in the battery case on the bottom plate. Please refer to **[7.4.4 Memory Backup]** for specifications and use of the battery.

1.3 J3 Simplified I/O Cables (option)

The cable connected to the input/output connectors on the rear panel are shown below. (Figure 1-8). Refer to **【1.2.2 1) Input/Output Connectors】** for the input/output signals from the cable branch connectors.

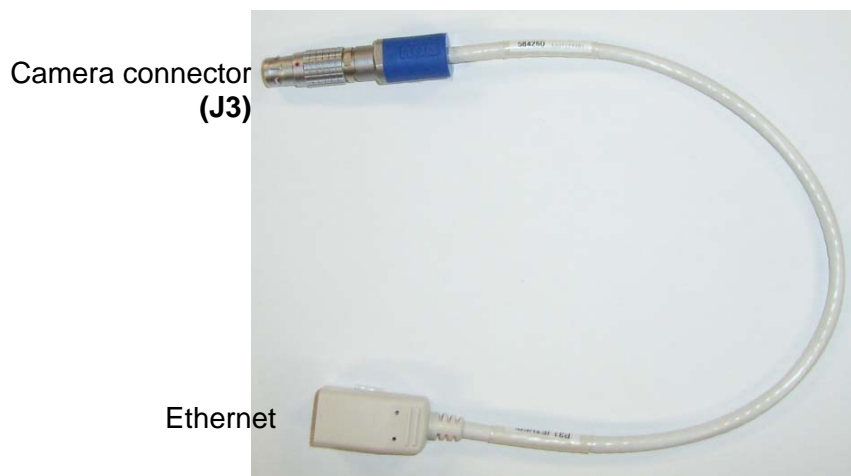


Figure 1-8 J3 Simplified I/O Cable

1.4 AC Adapter (option)

The exterior of the AC adapter is shown below (Figure 1-9).

A specialized power plug is installed on the output terminal of the AC adapter, which connects to the J1 cable POWER connector. The AC input terminal on the other end is a 3P plug and connects to AC100V ~240V power.

Power ON/OFF for the MEMRECAM GX-3 is performed by the AC adapter power switch.



Figure 1-9 AC Adapter



Warning

- Due to the danger of high voltage, do not open the cover.
- If using a 3P-2P conversion plug to connect to a power outlet, be sure the grounding wire for the conversion plug is connected to an external ground. If not grounded, electrical shock may occur from the metal parts or other areas of this unit.
- The AC adapter is a specialized part for the MEMRECAM GX-3, and so should not be used with other devices.

1.5 GXLink (option)

The control software GXLink is provided on a CD-ROM (Figure 1-10). Please refer to **【GXLink User's Manual】** for GXLink details.



Figure 1-10 Control Software GXLink

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2

Basic Operations

2.1 The Flow of Operations

The three methods to operate the MEMRECAM GX-3 are as follows.

- **Operation using the remote control J-PAD3 (OPTION)**
- **Operation using the control software GXLink**
- **Operation using external input/output signals**

This user's manual describes operation using the remote control J-PAD3.

The flow of operations for basic recording, playback and storage is shown in Figure 2-1. Settings using the J-PAD3 are described in Chapters 3, 4 and 5.

Refer to **【GXLink User's Manual】** for operations using the control software GXLink.

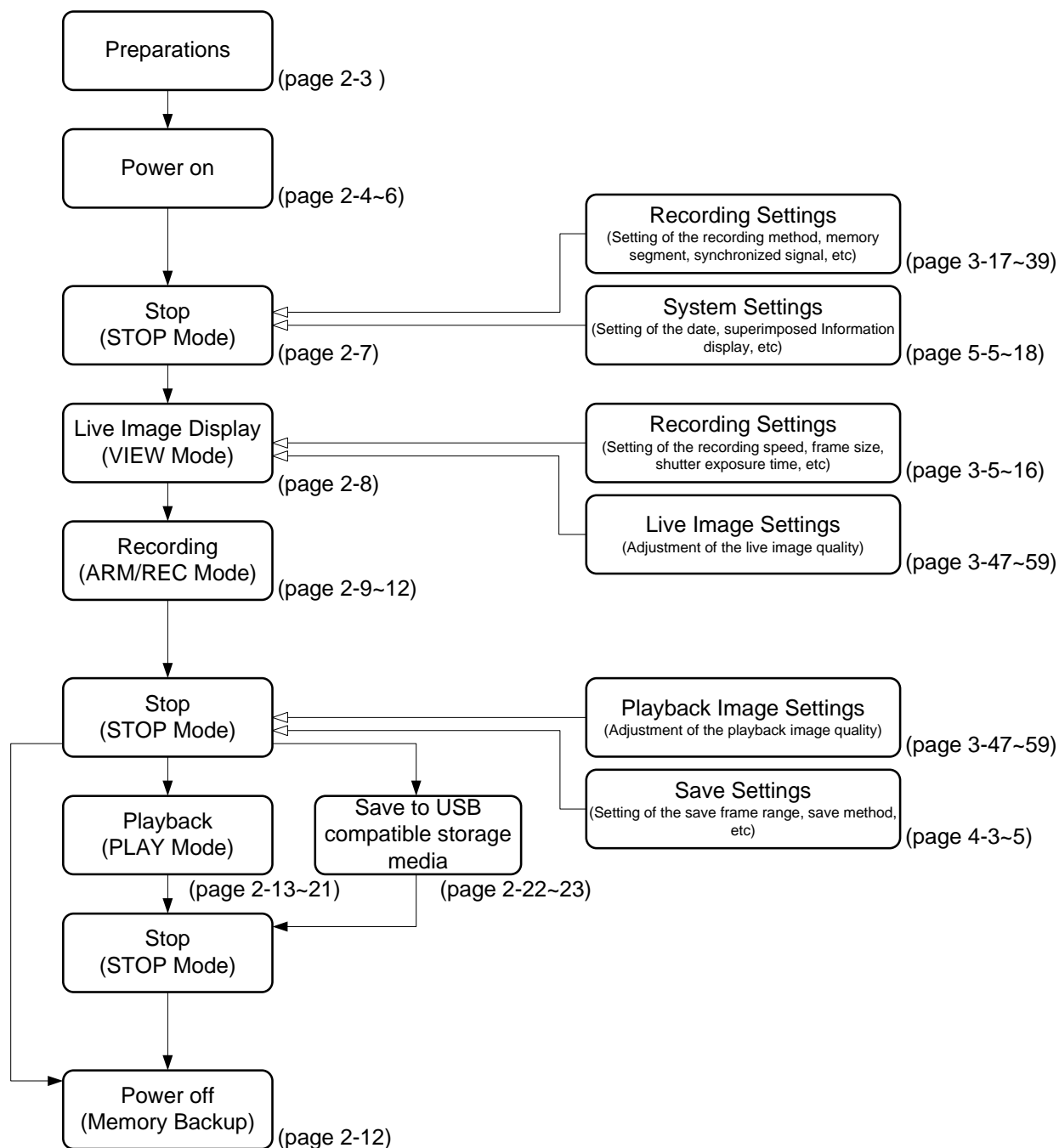


Figure 2-1 The Flow of Operations

2.2 Preparations

Prepare the devices shown in Table 2-1 and connect as shown in Figure 2-2.

Table 2-1 Devices to Prepare

Part	Model	Notes
MEMRECAM GX-3	V-190	Standard component
F mount lens		Option
AC adapter	584182-1	Option
Remote control J-PAD3	CR1011	Option
USB2.0 compatible storage		Option
Conversion cable for viewfinder	584888	Standard component
Viewfinder	ZO-971	Option
External triggering input power		Option
J3 simplified I/O cable	584260	Option
Control PC		Required when using the control software GXLink.

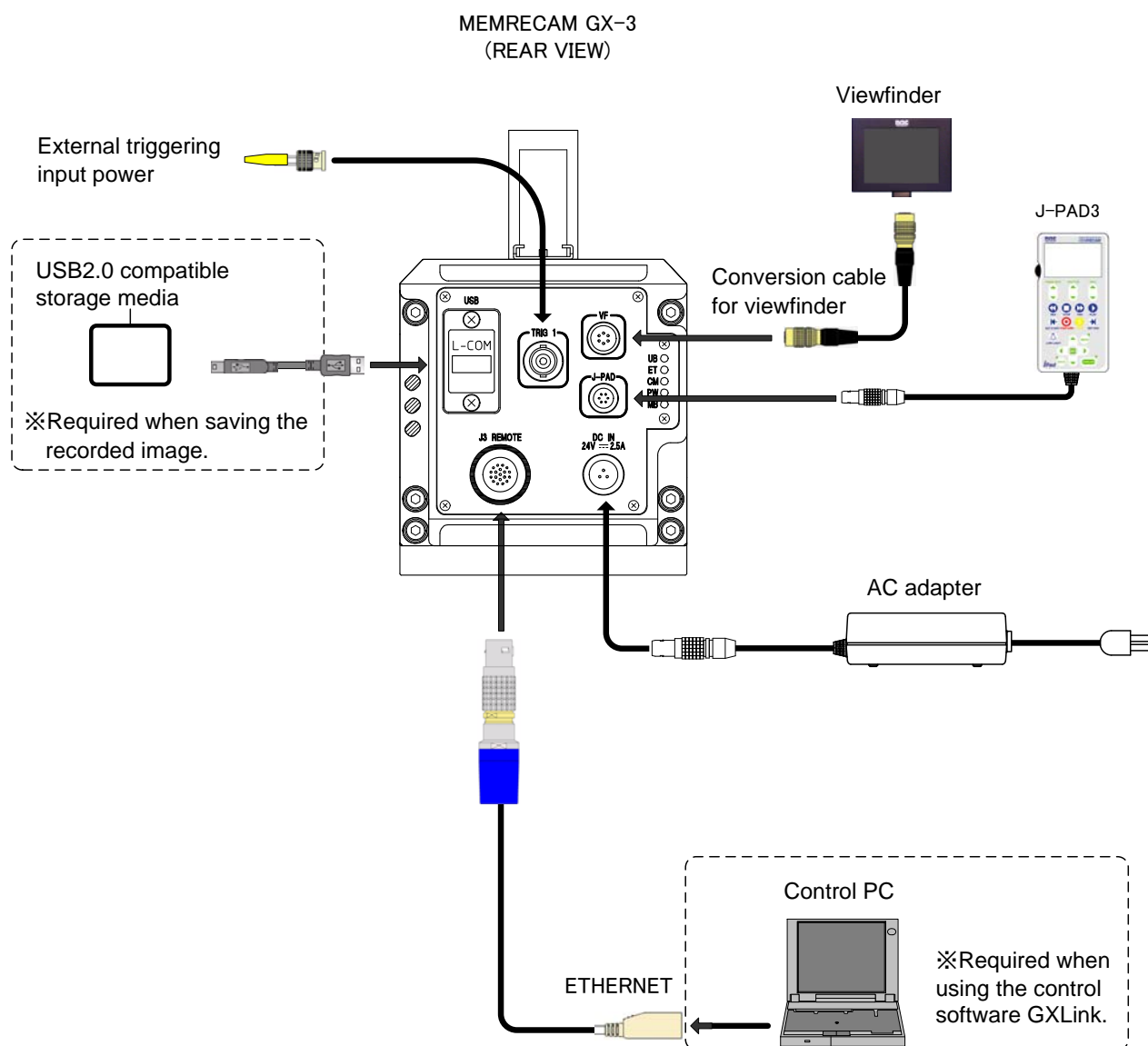


Figure 2-2 Connections for Each Device

2.3 Power

After connecting each device, turn the power on for the MEMRECAM GX-3 by plugging in the AC adapter power switch. There is no power switch for the main MEMRECAM GX-3 unit. Once the MEMRECAM GX-3 starts up, it enters the STOP mode.

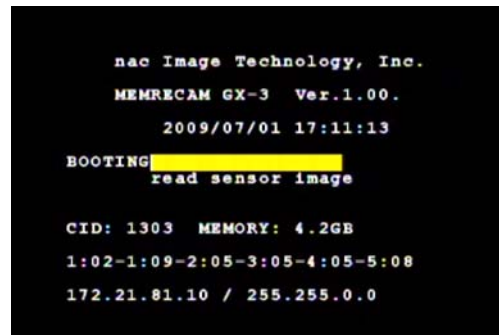
2.3.1 MEMRECAM GX-3 Startup

■ Viewfinder Image Display

- 1) Turn on the AC adapter power switch to power the MEMRECAM GX-3.
- 2) Press the viewfinder power switch to display the initial screen (Figure 2-3).
- 3) After a few moments, it will switch to the system information screen (Figure 2-4).
The yellow gauge in the center shows the status of the automatic camera diagnostics.



图 2-3 初期画面



- 4) After the automatic diagnostics have been completed, the test image recorded during automatic diagnostics is displayed and the MEMRECAM GX-3 enters the STOP mode. Nine areas of information are superimposed at the top and bottom of the screen (Figure 2-5).

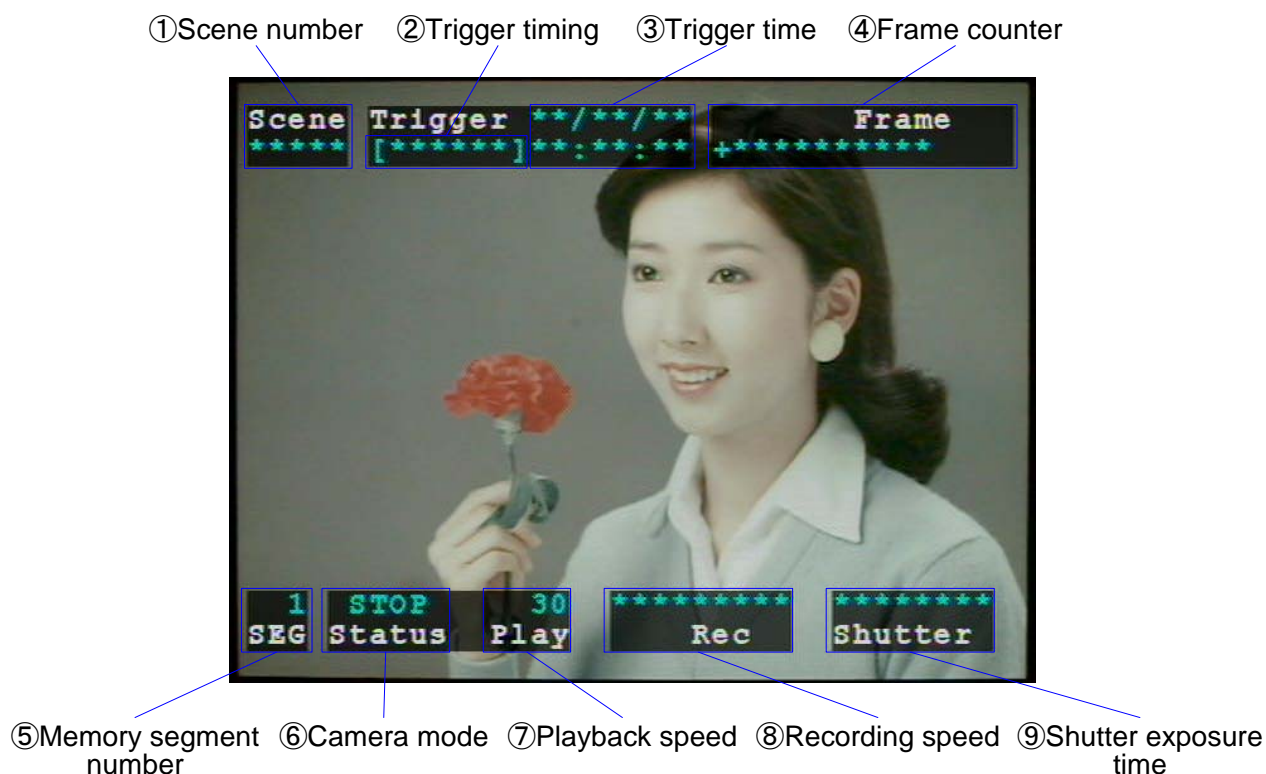


Figure 2-5 STOP mode screen

■ Main Unit Rear Panel LED Display

- 1) After turning on the power to the MEMRECAM GX-3, the main unit rear panel LED will display that shown in Figure 2-6 ① and ② until the automatic diagnostics have been completed.
- 2) Once the MEMRECAM GX-3 starts up normally and enters the STOP mode, the main unit rear panel LED will display that shown in Figure 2-6 ③.

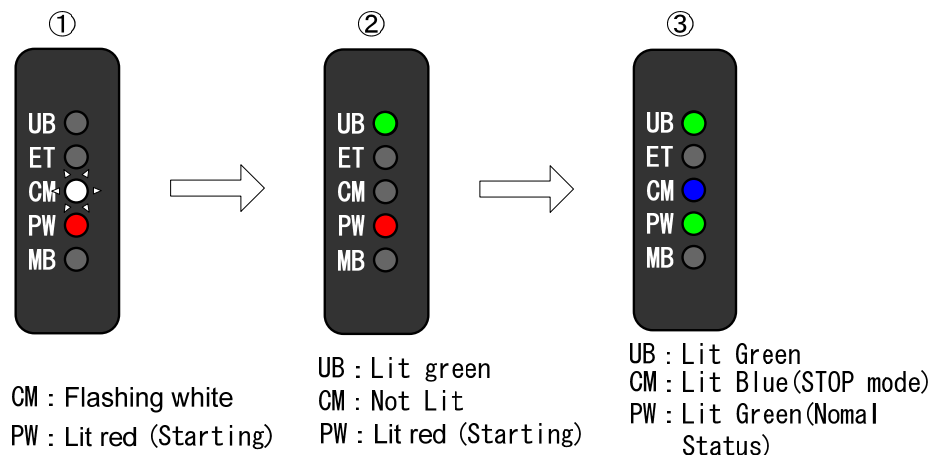


Figure 2-6 The Main Unit Rear Panel LED Display at Startup

2.3.2 Remote Control J-PAD3 Startup

- 1) After the MEMRECAM GX-1 power has been turned on, power is supplied to the remote control J-PAD3. There is no power switch on the J-PAD3 unit.

The version information screen is shown on the J-PAD3 LCD display. (Figure 2-7)

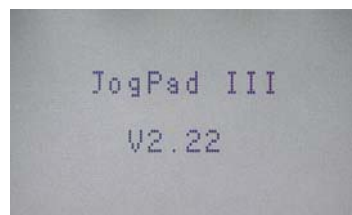


Figure 2-7 J-PAD3 version information screen

- 2) After a few moments, it will switch to the status screen for the STOP mode and the 11 statuses are displayed. (Figure 2-8).


	< STATUS >
① Camera mode	MODE : STOP
② Frame counter	FRAME : +000000
③ Frame time	TIME : ** . *****
④ Playback speed	PLAY : 30
⑤ Recording speed	FRM RATE : 1000
⑥ Frame size	FRM SIZE : 1280x1024
⑦ Shutter exposure time	SHUTTER : OPEN
⑧ Trigger timing	TRIGGER : CENTER
⑨ ID number	ID : 000
⑩ Scene number	SCENE : 00000
⑪ Playback range bar	

Figure 2-8 Status Screen (STOP mode)

2.4 Stop (STOP Mode)

■ Switching to the STOP Mode

Press STOP .

MEMRECAM GX-3 normally starts up in the STOP mode. If operating in any mode other than STOP, press J-PAD3 STOP  to stop operation and access the STOP mode.

Settings relating to recording conditions, playback conditions and storage are performed in the STOP mode. Refer to **【3 Recording and Playback Settings】** and **【4 Save Settings】** for these settings.

■ Image Display

The test recorded image is displayed during the automatic diagnostics at startup. Information is superimposed at the bottom and top of the screen and the camera mode (Status) is displayed as "STOP" (Figure 2-9). At this point, the memory is empty and the superimposed information indicates "*" for the image.

The memory segment number (SEG) and the playback speed (PLAY) are shown regardless of the presence of recording memory.

The superimposed information displayed in blue is information relating to the image saved in the memory or playback information



Figure 2-9 Image Display (STOP Mode)

Caution) In the starting at the time of backup by a Battery, the already recorded image (image at the time of the last operation) is displayed.

■ J-PAD3 Display

The status screen is shown in Figure 2-10, and the camera mode "STOP" is displayed. At startup, if the memory is empty, the factory settings are shown on the status screen.

The "TIME" cannot be determined until recording has ended, so "*" is shown.

The playback range bar is shown empty.



Figure 2-10 J-PAD3 Display (STOP Mode)


■ Rear Panel LED Display

During the STOP mode, the CM LED is lit up in blue.

2.5 Live Image Display (VIEW Mode)

■ Switching to VIEW mode

Press VIEW/ARM .

In the STOP mode, access the VIEW mode each time J-PAD3 VIEW/ARM  is pressed.

Set the recording conditions in the VIEW mode. Refer to **[3 Recording and Playback Settings]** for the settings for recording conditions.

■ Image Display

In the VIEW mode, the image photographed is displayed live. The superimposed information is displayed at the top and bottom of the screen, and the camera mode (STATUS) is shown as "VIEW" (Figure 2-11).

The superimposed information shown in red is the current recording conditions. If the recording conditions are changed, the live image and the superimposed information are also changed.

Trigger time or the present time recorded on the image to record is displayed on a trigger (Trigger).

Refer to **[5.2.6 OSD TIME]** for setting for OSD conditions.



Figure 2-11 Image Display (VIEW Mode)



Figure 2-12 Image Display (VIEW Mode)
Image trigger selection

■ J-PAD3 Display

The status screen is shown in Figure 2-13, and the camera mode "VIEW" is displayed. The current recording conditions are shown on the status screen during VIEW. If the recording conditions are changed, status screen is also changed.

The status screen information for the frame counter (Frame) and the frame time (Time) remain unchanged from that of the STOP mode.



Figure 2-13 J-PAD3 Display (VIEW Mode)

■ Rear Panel LED Display

During the STOP mode, the CM LED is lit up in white.

2.6 Recording

The MEMRECAM GX-3 memory is comprised of a ring buffer (a circular memory) where the first recorded image and the last recorded image are connected for saving. Recording starts with a photographed image which is sequentially saved in the ring buffer (memory). After the ring buffer completes one cycle, the subsequent new image is written over. This state continues until recording trigger signals are input.

If recording triggers include the following three kinds of triggers and one of recording triggers is detected, I will record the number of recording flames set up by 【3.2.1 Selection of recording timing】 , and will end recording.

- J-PAD3 and the trigger command from reactor-control software
- Input the external trigger signal (TRIG 1 line connector of a rear panel, TRIG 2 line connector of J3 cable)
- Image trigger (Refer to **【3.2.7 image trigger function】**)

Switch to the camera mode for recording. Use the remote control J-PAD3 to switch to the camera mode (Figure 2-14).

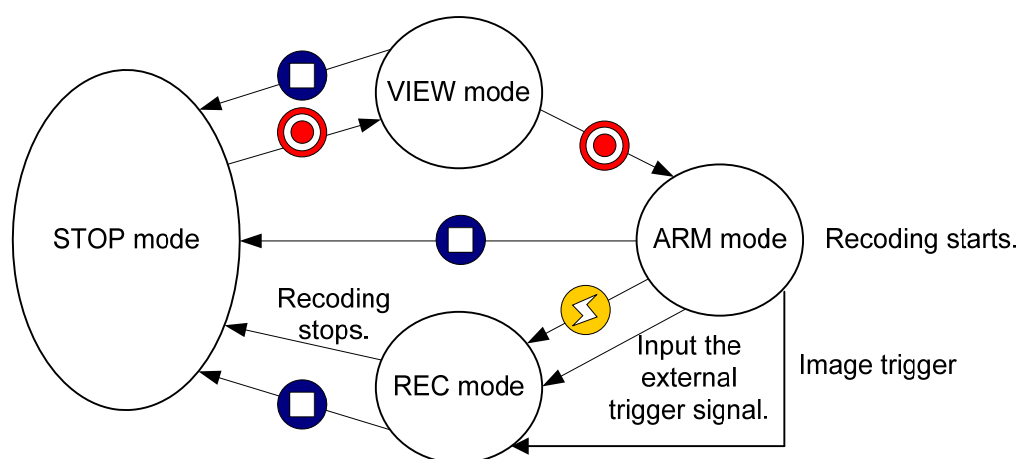


Figure 2-13 Summary of Operations with the J-PAD3

2.6.1 ARM Mode


Caution) Before Switching to the ARM Mode

Images saved in the memory will be erased when new images are saved over them by switching to the ARM mode. Switch to the ARM mode after verifying if the images are to be erased.

Save images needed in a USB compatible storage media or in a control PC. Refer to either **[2.9 Saving]** or **[GXLink User's Manual]** for the method to save images.

■ Switching to the ARM Mode

Press VIEW/ARM .

In the VIEW mode, access the ARM mode each time J-PAD3 VIEW/ARM  is pressed, and start recording.

The recording conditions may not be changed until recording stops.

■ Image Display

In the ARM mode, the image photographed is displayed live. The superimposed information is displayed at the top and bottom of the screen, and the camera mode (STATUS) is shown as "ARM" (Figure 2-14).

Once recording starts, all of the superimposed information is shown in red.

After trigger input, the number of saved frames is displayed in the frame counter (Frame) according to the trigger timing (Trigger). Refer to **[3.2.1 Trigger Timing Selection]** for trigger timing.

With Trigger, "*" is displayed until recording has ended.



Figure 2-15 Image Display (ARM Mode)

■ J-PAD3 Display

The status screen is shown in Figure 2-15, and the camera mode "ARM" is displayed. The established recording conditions are shown in the ARM mode status screen.

The frame "TIME" cannot be determined until recording has ended, so "*" is shown.

"0" is shown in the frame counter (FRAME) until recording has ended.




Figure 2-16 J-PAD3 Display (ARM)


■ Rear Panel LED Display

During the STOP mode, the CM LED is lit up in magenta.

2.6.2 REC Mode

■ Switching to REC Mode

Press TRIG . Or, input the external trigger signal.

In the ARM mode, access the REC mode each time J-PAD3 TRIG  is pressed or when an external trigger signal is input from TRIG 1 line connector of a rear panel. Refer to **【3.2.12 External Trigger Signal Selection】** for external trigger input.

Once into the REC mode, recording ends according to the set trigger timing. Refer to **【3.2.1 Trigger Timing Selection】** for trigger timing.

Once recording stops, it switches to the STOP mode.

。

■ Image Display

In the REC mode, the image photographed is displayed live. The superimposed information is displayed at the top and bottom of the screen, and the camera mode (STATUS) is shown as "REC" (Figure 2-17).

After trigger input, the value for the frame counter (Frame) is lowered for each recorded frame saved.

With Trigger, "*" is displayed until recording has ended.



Figure 2-17 Image Display (REC Mode)

■ J-PAD-3 Display

The status screen is shown in Figure 2-17, and the camera mode "REC" is displayed. The established recording conditions are shown in the REC mode status screen.

The frame "TIME" cannot be determined until recording has ended, so "*" is shown.

"0" is shown in the frame counter (FRAME) until recording has ended.

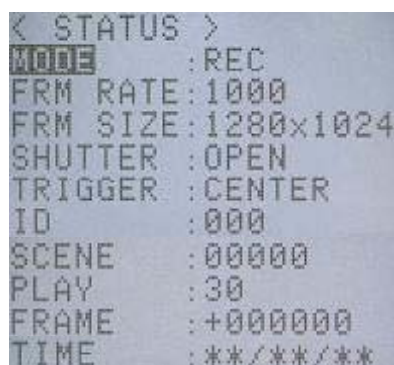


Figure 2-18 J-PAD3 Display (REC Mode)

■ Rear Panel LED Display

During the STOP mode, the CM LED is lit up in orange.

。

2.7 Memory Backup

Once recording stops, it automatically switches from the REC mode to the STOP mode. At the same time, the memory backup function activates (Figure 2-19). The memory backup status can be verified by the rear panel LED display (Table 2-2). Therefore, even if the external power is cut off, the images saved in the memory using the battery can be retained (Figure 2-20).

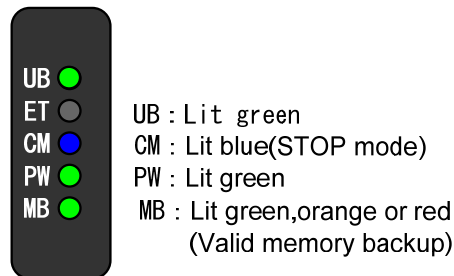


Figure 2-19 Memory Backup with external Power

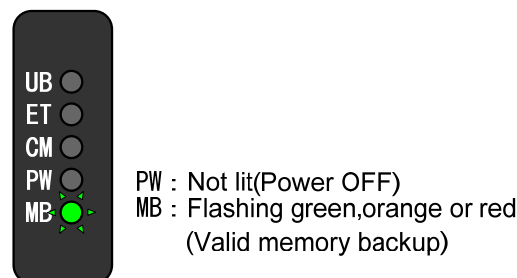


Figure 2-20 Memory Backup with Battery Power

Table 2-2 Memory Backup Status Display with MB LED

MB LED (Memory Backup)	Lit green	Valid memory backup, Charge: High (backing up with external power)
	Flashing green	Valid memory backup, Charge: High (backing up with battery)
	Lit orange	Valid memory backup, Charge: Medium (backing up with external power)
	Flashing orange	Valid memory backup, Charge: Medium (backing up with battery)
	Lit red	Valid memory backup, Charge: Low (backing up with external power)
	Flashing red	Valid memory backup, Charge: Low (backing up with battery)
	Not lit	No memory backup data

- CAUTION)**
- The charge amount is impacted by differences in batteries and the ambient temperature, and is not precisely displayed. Use only as a guide.
 - If the LED color turns from flashing orange to flashing red during battery backup, charge the battery as soon as possible. Turning on the external power (e.g. AC adapter) to the MEMRECAM GX-3, battery charge starts. If used as is, the excess charge protective function will be activated and the images in the memory will be lost.

2.8 Playback

Images recorded can be played back as follows.

- **Single frame playback (PLAY Mode)**
- **Loop playback (LOOP Mode)**
- **Playback at varying speeds**
- **Skip forward, fast forward, rewind**
- **Frame jumping**
- **Set playback range**

For the single frame playback, loop playback and playback at varying speeds, a summary of the J-PAD3 key operation follows (Figure 2-21, 22).

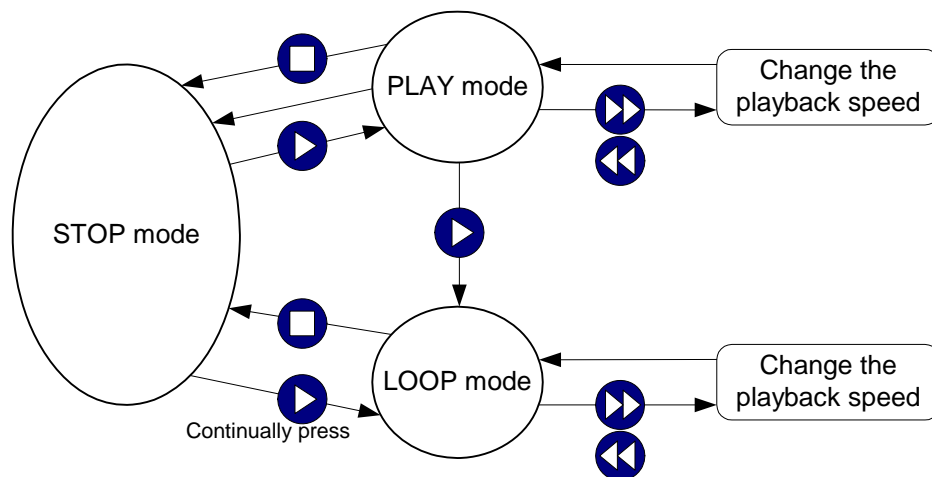


Figure 2-21 Single Frame Playback, Loop Playback and Playback at Varying Speeds with the J-PAD3

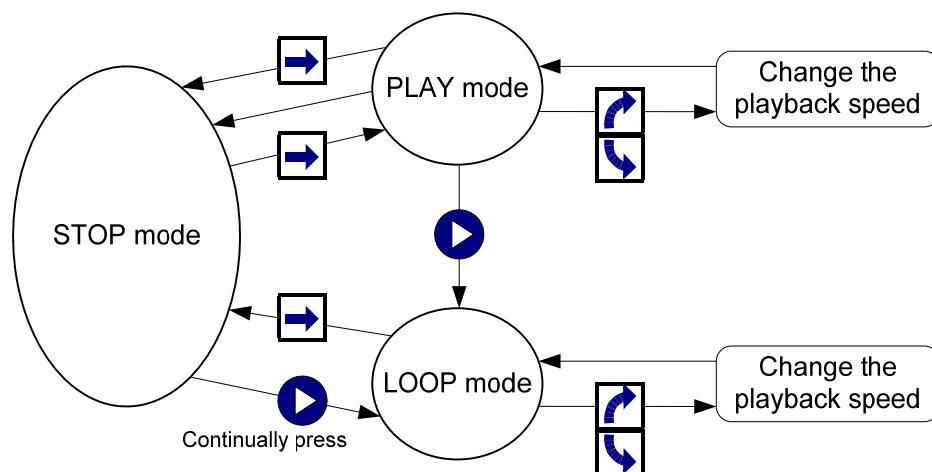


Figure 2-22 Single Frame Playback, Loop Playback and Playback at Varying Speeds with the J-PAD3 (using the dial)

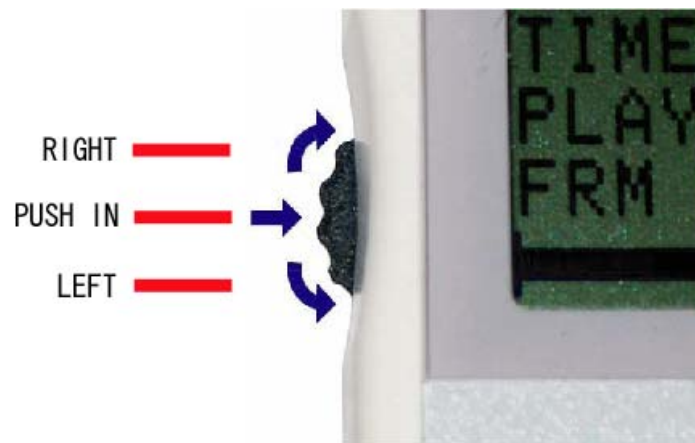





Fig. 2-23 Dial key operation of J-PAD3

2.8.1 Single Frame Playback (PLAY Mode)

■ Single Frame Playback Method

Press **PLAY** . Or press the dial .

During the STOP mode, press J-PAD3 **PLAY**  or press the dial  to access the PLAY mode (Figure 2-20, 21). Recorded images are played back in single frames. With single frame playback, the set playback range is only played back one time.

To stop single frame playback, play until the final frame or press **STOP** .

■ Image Display

In the PLAY mode, the recorded image is played back by single frames. Information is superimposed at the bottom and top of the screen and the camera mode (Status) is displayed as "PLAY" (Figure 2-24).

The frame number for the image played back is displayed on the frame counter (Frame).



Frame 2-24 Image Display (PLAY Mode)

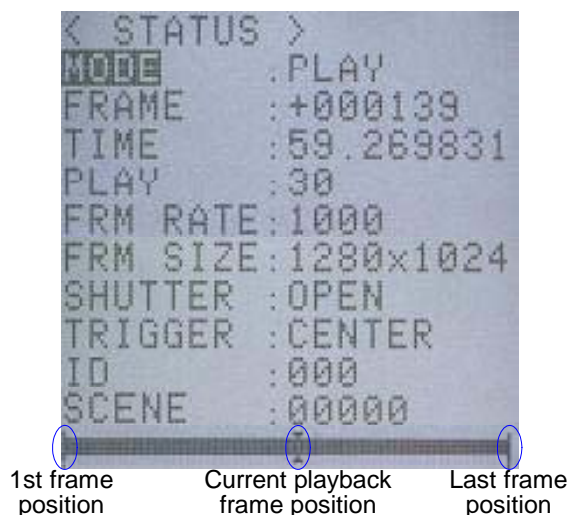
■ J-PAD3 Display

The status screen is shown in Figure 2-23, and the camera mode "PLAY" is displayed. The recording conditions for photographing are shown on the status screen during the PLAY mode.

The frame number for the image played back is shown in the frame counter (FRAME).

The recording time for the image played back is shown in the frame time (TIME).

There will be a mark showing the current playback frame position on the playback range bar. This mark will move to the last frame position and then the single frame playback will stop.





Frame 2-25 J-PAD3 Display (PLAY Mode)

2.8.2 Loop Playback (LOOP Mode)

■ Loop Playback Method

Continually press PLAY . Or press PLAY  twice.

During the STOP mode, continually press PLAY  or press PLAY  again during the PLAY mode to access the LOOP mode (Figure 2-27, 28). Recorded images are played back in a loop. With loop playback, the set playback range is played back repeatedly.

To stop loop playback, press STOP  or press the dial ().

■ Image Display

In the LOOP mode, the recorded image is played back in a loop. Information is superimposed at the bottom and top of the screen and the camera mode (Status) is displayed as "LOOP" (Figure 2-24).

The frame number for the image played back is displayed on the frame counter (Frame).



Figure 2-26 Image Display (LOOP Mode)

■ J-PAD3 Display

The status screen is shown in Figure 2-27, and the camera mode "LOOP" is displayed. The recording conditions for photographing are shown on the status screen during the LOOP mode.

The frame number for the image played back is shown in the frame counter (FRAME).

The recording time for the image played back is shown in the frame time (TIME).

There will be a mark showing the playback frame position on the playback range bar. This mark will move to the end frame position for playback (recording) and then it will jump to the 1st frame and replay.

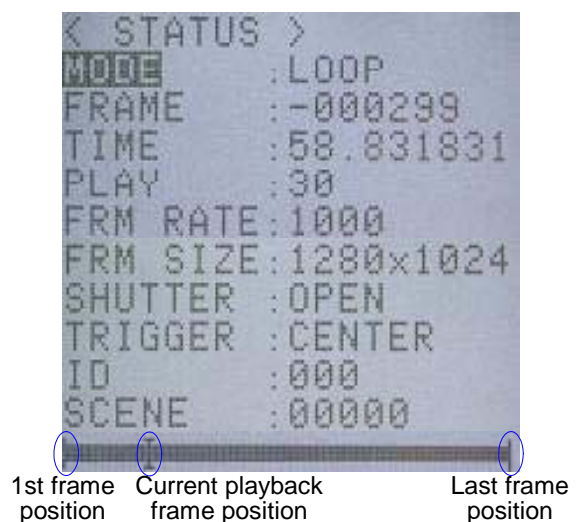




Figure 2-27 J-PAD3 Display (LOOP Mode)

2.8.3 Playback at Varying Speeds

During the PLAY mode or the LOOP mode, press FWD  or REV  to change the playback speed (Figure 2-21, 22). Each operation is shown in Table 2-3.

The playback speeds that can be set are different depending on the video output method. Table 2-4 shows the playback speeds for the NTSC method and the PAL method. Refer to **【5.2.15 Video Output Method Selection】** for the method of setting the video output method.

Table 2-3 Playback at Varying Speeds



Playback Speed	Operation
Forward	Press FWD  .
Reverse	Press REV  Continually press to playback in the reverse direction (negative playback speed).

Table 2-4 Playback Speeds that can be Set (NTSC/PAL)

Video Output Method	Playback Speed (pps)
NTSC	-1920, -960, -480, -240, -120, -60, -30, -15, -10, -5, -2, -1, 1, 2, 5, 10, 15, 30, 60, 120, 240, 480, 960, 1920
PAL	-2000, -1000, -800, -400, -200, -100, -50, -25, -10, -5, -2, -1, 1, 2, 5, 10, 25, 50, 100, 200, 400, 800, 1000, 2000

2.8.4 Skip Forward, Fast Forward, Rewind















During the STOP mode, use FWD , REV , or turn the dial to the right () or turn the dial to the left () to skip forward, fast forward and rewind (Figures 2-28, 29), Table 2-5 shows each operation.

Table 2-5 Skip Forward, Fast Forward, Rewind

	Operation	
Skip Forwards	Press FWD  once.	Turn dial to the right ()
Skip Backwards	Press REV  once.	Turn dial to the left ()
Fast Forward	Continually press FWD  . Release to stop.	Press dial while turning to the right ( + ). Release to stop.
Rewind	Continually press REV  . Release to stop.	Press dial while turning to the left ( + ). Release to stop.

A summary of the J-PAD3 operations is given below to skip forwards, fast forward and rewind. (Figure 2-28,29)

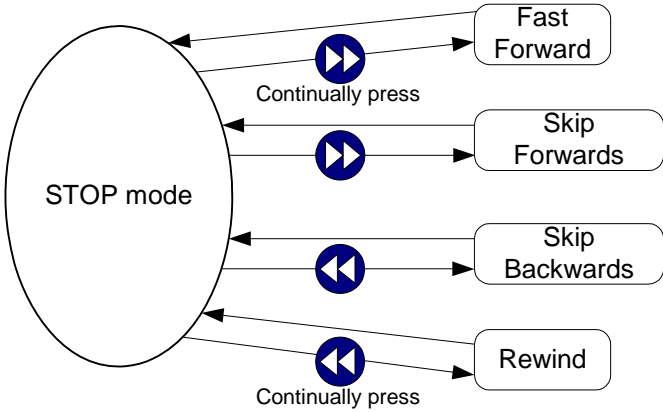


Figure 2-28 Skip Forward, Fast Forward, Rewind using the J-PAD3

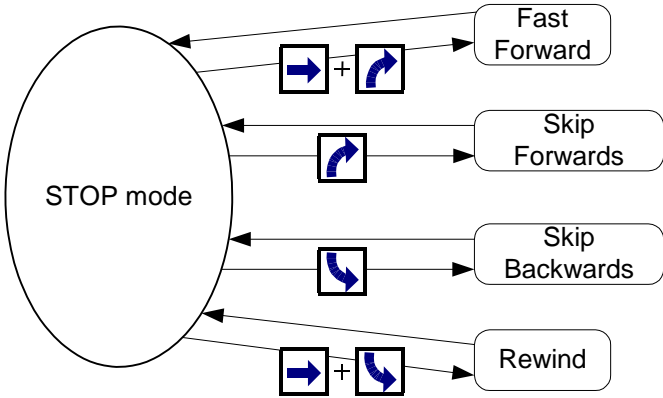


Figure 2-29 Skip Forward, Fast Forward, Rewind using the J-PAD3 (Using the Dial)

2.8.5 Frame Jumping


















During the STOP mode, use TRIG , REV , FWD , or turn the dial to the right () or turn the dial to the left () to jump to a particular frame. (Figures 2-30,31) Frames for jumping and the operations are shown in Table 2-6.

Table 2-6 Frame Jumping

Frames for Jumping	Operation	
1st frame	Press TRIG  while pressing REV  .	Press TRIG  while turning the dial to the left ( .
Trigger frame	Press TRIG  .	
Last frame	Press TRIG  while pressing FWD  .	Press TRIG  while turning the dial to the right ( .
Event frame	Press TRIG  .	

- With burst recorded images, press TRIG  to sequentially jump to the top frame where the burst trigger was input.
- With multi trigger recorded images, press TRIG  to sequentially jump to the trigger frame for each block.

A summary of the J-PAD3 operations for frame jumping is as follows (Figures 2-30,31).

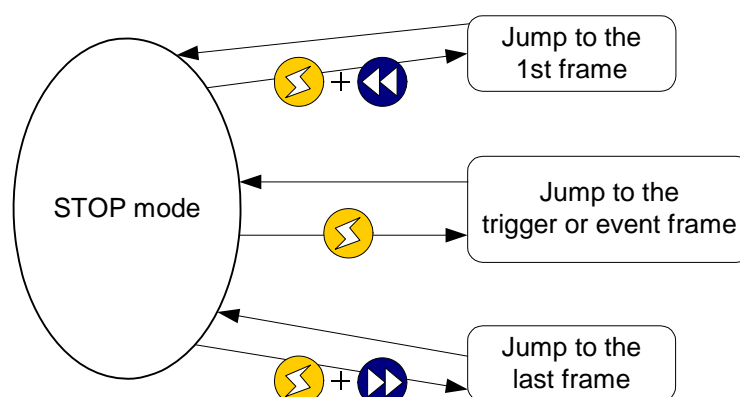


Figure 2-30 Frame Jumping Using the J-PAD3

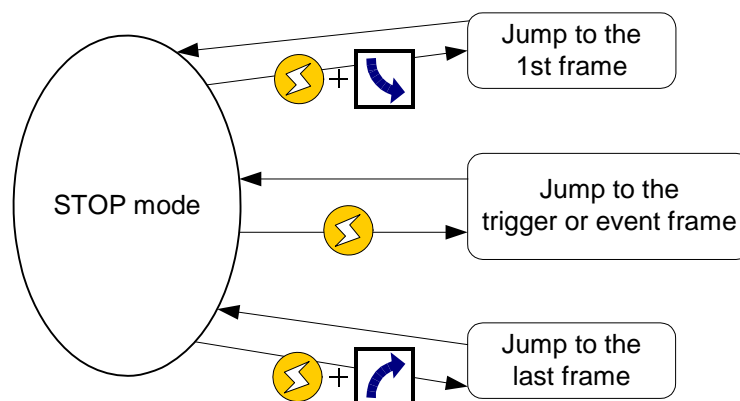


Figure 2-31 Frame Jumping Using the J-PAD3 (Using the Dial)

2.8.6 Playback Range Settings
















During the STOP mode, use S.SET , E.SET , STOP , or turn the dial to the right () or turn the dial to the left () to set the playback range. (Figures 2-32,33) The operations for setting the starting playback frame and the ending playback frame are shown in Table 2-7.

Table 2-7 Playback Range Settings

	Operation	
Set starting playback frame	Press S.SET  .	Press STOP  while turning the dial to the left ()
Set ending playback frame	Press E.SET  .	Press STOP  while turning the dial to the right ()
Delete starting playback frame	Continually press S.SET  .	
Delete ending playback frame	Continually press E.SET  .	
Delete playback range		Press STOP  while pressing the dial ()

A summary of the J-PAD3 operations is given below to set the playback range. (Figures 2-32,33).

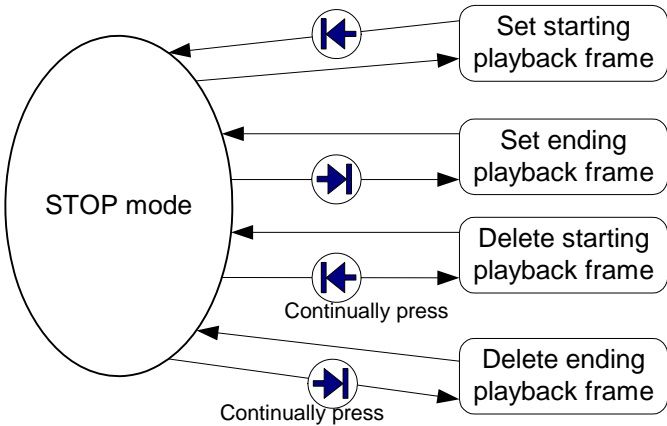


Figure 2-32 Playback Range Settings Using the J-PAD3

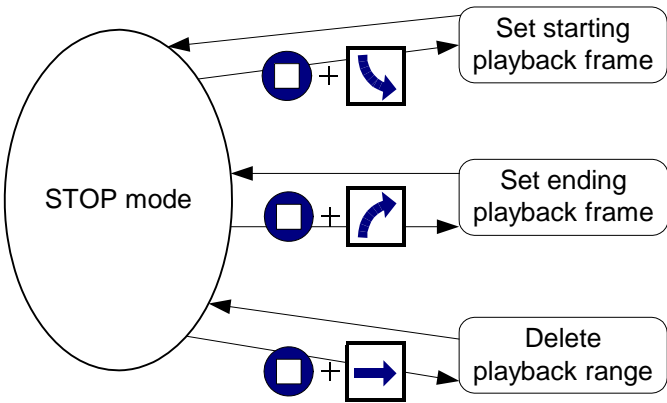







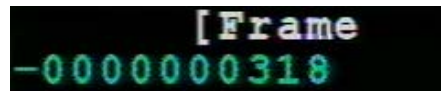
Figure 2-33 Playback Range Settings Using the J-PAD3 (Using the Dial)

■ Method to Set the Playback Range






Next is the procedure for setting the playback starting frame and the playback ending frame.

- 1) During the STOP mode, press FWD  or REV  to display the frame to be set as the playback starting frame.
- 2) Press S.SET  or STOP  while turning the dial to the left () to set the currently displayed frame as the playback starting frame.

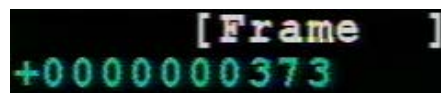
Once the playback starting frame has been set, [Frame will be displayed in the frame counter superimposed on the image.



* Continually press S.SET  to delete the playback starting frame settings.

- 3) During the STOP mode, press FWD  or REV  to display the frame to be set as the playback ending frame.
- 4) Press E.SET  or STOP  while turning the dial to the right () to set the currently displayed frame as the playback ending frame.

Once the playback starting frame and ending frame has been set, [Frame] will be displayed in the frame counter superimposed on the image.



*Continually press E.SET  to delete the playback ending frame settings.

The playback range set from the recorded frames will be shown in black on the playback range bar displayed in the J-PAD3 status screen (Figure 2-34).

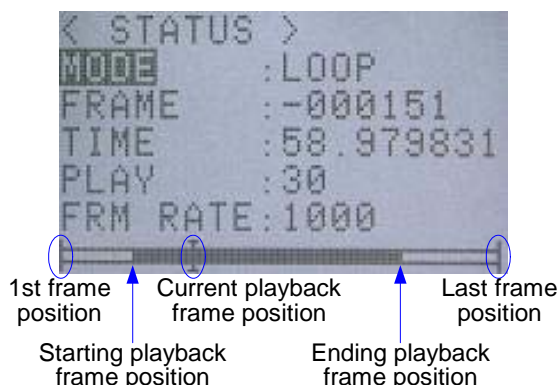




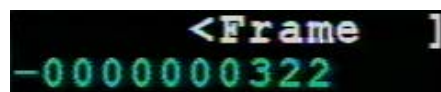
Figure 2-34 J-PAD3 Display (During Playback Range Loop Playback)

* The frame jumping function is not available for the set playback beginning and ending frames.

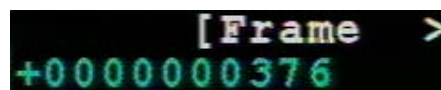
■ Playback of Frames Not in the Playback Range

After setting the playback range, press FWD  or REV  during the STOP mode to playback frames not in the playback range.

If playing back from a frame before the starting frame, <Frame] will show in the frame counter superimposed on the image.





If playing back from a frame after the ending frame, [Frame > will show in the frame counter superimposed on the image.



2.9 Save to USB compatible storage media

Connect USB compatible storage media to the USB connector of a rear panel and send the recorded images to be saved.

The storage method given below is a method that uses the direct download key  on the J-PAD3. All of the recorded frames are saved as video files (MCFF). Detailed settings for saving can be found in **【4 Save Settings】**.

- 1) After recording, it switches to the STOP mode.
- 2) Connect a USB2.0 compatible storage media to of a rear panel.
- 3) Press J-PAD3 DOWNLOAD  to display the transmit mode screen. (Figure 2-33).

CAUTION) The save starting frame (START) and the save ending frame (END) will be displayed but the save range cannot be changed. Refer to **【4.2.1 Save Frame Range Settings】** for settings for the save range.

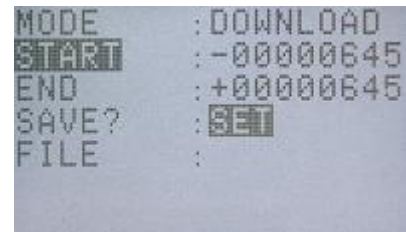



Figure 2-35 Transmit Mode Screen

- 4) "SET" will be flashing so press J-PAD3 SET  to start saving.

Once saving is started, the file name of "MCFF0000.MCF" will automatically be set (Figure 2-34). If continuing to save, the next file name will be set at "MCFF0001.MCF" and +1 will be added to the number.

A progress bar is shown at the bottom of the screen indicating the saving status.




Figure 2-36 Start Download

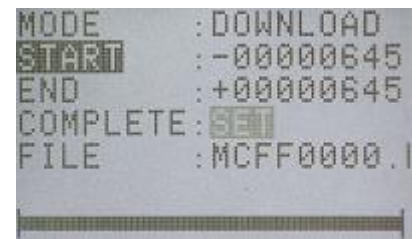
CAUTION) If there is insufficient space in the storage media for the range of frames to be saved, the images will not be saved. Refer to **【4.2.1 Save Frame Range Settings】** to verify the number of frames that can be saved.

Camera mode (Status) is displayed as "SAVE" during preservation (Figure 2-37).



Figure. 2-37 Image display (during save)
USB Save

- 5) Once savein is complete, "COMPLETE" will be shown, as in Figure 2-35. "SET" will be flashing again so press J-PAD3 SET  to finish saving the images.



```
MODE : DOWNLOAD
START : -00000645
END : +00000645
COMPLETE: SET
FILE : MCFF0000.I
```

Figure 2-39 Finish download

CAUTION) Saved video files (MCFF) cannot be reloaded on the MEMRECAM GX-1. Saved files can be verified by opening with the control software GXLink. Refer to **【GXLink User's Manual】** for the method to verify saved files.

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3

Recording and Playback Settings


3.1 Items That Can Be Set

It is possible to set the recording conditions to photograph according to various objectives. Also, by changing the various playback conditions, the desired image can be viewed.

Use the specialty remote control J-PAD3 to set the items relating to recording and playback from the following menus.

- TOP MENU
- SYS MENU
- VIEW MENU

3.1.1 TOP MENU Settings

While in the STOP mode, press MENU  to switch from the status screen to the TOP MENU (Figure 3-1). The following items can be set in the TOP MENU (Table 3-1).

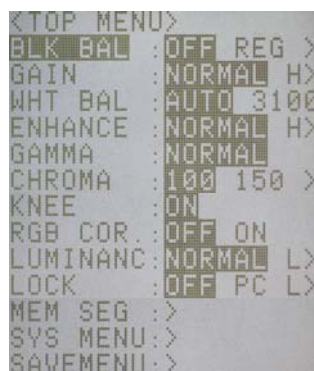




Figure 3-1 TOP MENU




Table 3-1 TOP MENU Settings

Settings	Setting Details	
BLK BAL	Black balance	
GAIN	Gain adjustment of playback image	
WHT BAL	White balance of playback image	
ENHANCE	Enhance correction of playback image	
GAMMA	Gamma correction of playback image	
CHROMA	Chroma adjustment of playback image	
KNEE	Knee adjustment of playback image	
RGB COR.	RGB matrix adjustment of playback image	
LUMINANC	Brightness characteristics setting of playback image	
LOCK	PC operation lock setting	Refer to Chapter 5 "System Settings"
MEM SEG	Select the playback memory segment number	
SYS MENU	Jump to the SYS MENU	
SAVE MENU	Jump to the SAVE MENU	Refer to Chapter 4 "Save Settings"

After setting in the TOP MENU, press STOP  or MENU  to return to the status screen (STOP mode).

3.1.2 SYS MENU Settings

While in the STOP mode, press MENU  to switch from the status screen to the TOP MENU.

Using the arrows,   select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU (Figure 3-2). The following items can be set in the SYS MENU (Table 3-2).




```

TOP MENU > SYS MEN
ID :000
DATETIME:09 09 11
OSD DISP:ALL
OSD MODE:ALWAYS S>
OSD TIME:TRIG CRNT
CAFM DIS:OFF WHT >
FRM DISP:FRAME TI>
FRM TIME:TRIGGER >
REL TIME:FRAME TR>
TIMESTAMP:OFF ON
EXP TIME:K4compat
SYNCTIME:IRIG
SYNC SEL:EST2
EST VIEW:ON
VIDEOOUT:ON
ZOOM :FIT1 FIT2
SCROLL :0 0
BEEP :ON OFF
AUTOVIEW:OFF AUTO>
WARNING :>
TRIG SET:>
SIG SET :>
SYS SET :>
INFO :>

```

Figure 3-2 SYS MENU
Table 3-2 SYS MENU Settings

Settings	Setting Details	
ID	ID number setting	Refer to Chapter 5 "System Settings"
DATETIME	Date and time setting	Refer to Chapter 5 "System Settings"
OSD DISP	Display/do not display superimposed information	Refer to Chapter 5 "System Settings"
OSD MODE	Display/hide the superimposed information by the camera mode	Refer to Chapter 5 "System Settings"
OSD TIME	Trigger clock setting	Refer to Chapter 5 "System Settings"
CAFM DIS	Display/do not display mark for center of image	Refer to Chapter 5 "System Settings"
FRM DISP	Frame counter display setting	Refer to Chapter 5 "System Settings"
FRM TIME	Frame time standard setting	Refer to Chapter 5 "System Settings"
REL TIME	Flame relative time display setting	Refer to Chapter 5 "System Settings"
TIMESTAMP	Time stamp recording setting	
EXP TIME	Exposure timing setting	
SYNC TIME	Synchronized time setting	
SYNC SEL	Synchronized signal setting	
EST VIEW	The synchronized signal setting at the time of EST VIEW	
VIDEOOUT	Display/do not display image	Refer to Chapter 5 "System Settings"
ZOOM	Zoom playback image	
SCROLL	Scroll playback image	
BEEP	Remote control operation sound ON/OFF	Refer to Chapter 5 "System Settings"
AUTOVIEW	Automatic switch to VIEW mode	Refer to Chapter 5 "System Settings"
WARNING	Display/do not display warnings	Refer to Chapter 5 "System Settings"
TRIG SET	External trigger setting, recording method setting	
SIG SET	External input/output signal polarity setting	
SYS SET	Segment memory setting, reboot	
INFO	System information display (cannot be set)	Refer to Chapter 5 "System Settings"

After setting in the SYS MENU, press STOP  or MENU  to return to the status screen (STOP mode). Also, select "TOP MENU > SYS MEN" at the top of the SYS MENU and press SET  to return to the TOP MENU.

3.1.3 VIEW MENU Settings




While in the VIEW mode, press MENU  to switch from the status screen to the VIEW MENU (Figure 3-3). The following items can be set in the VIEW MENU (Table 3-3).



Figure 3-3 VIEW MENU

Table 3-3 VIEW MENU Settings

Settings	Setting Details	
SCENE	Recording scene number setting	
TRIGGER	Trigger timing setting	Can be set with the direct key
FRM RATE	Recording speed setting	Can be set with the direct key
FRM SIZE	Frame size setting	
CUSTOM F	Recording speed, frame size custom setting	
SHUTTER	Shutter exposure time setting	Can be set with the direct key
AOI	Area of Interest setting	
IMG TRIG	Image trigger setting	
AE	Automatic exposure setting	
DRES	DRES mode setting	
LOWLIGHT	Low light mode setting	
GAIN	Gain adjustment of live image	
WHT BAL	White balance of live image	
ENHANCE	Enhance correction of live image	
GAMMA	Gamma correction of live image	
CHROMA	Chroma adjustment of live image	
KNEE	Knee adjustment of live image	
RGB COR.	RGB matrix adjustment of live image	
LUMINANC	Brightness characteristics setting of live image	
DEPTH	Recorded bit length setting	
ZOOM	Zoom live image	
SCROOL	Scroll live image	

After setting in the VIEW MENU, press STOP  or MENU  to return to the status screen (VIEW mode).

3.2 Recording Settings

Settings related to recording in Table 3-2 and Table 3-3 are described below.

3.2.1 Trigger Timing Selection (TRIGGER)

While in the VIEW mode, the trigger timing can be selected using the VIEW MENU on the J-PAD3. The trigger timing can also be selected with the direct key.

With trigger timing, the number of recorded frames from the start of recording to the trigger input, and the ratio of recorded frames from the trigger input to the end of recording can be set.

- Start Trigger (START)
- Center Trigger (CENTER)
- End Trigger (END)
- Custom Trigger (+000%)












- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Select "TRIGGER" from the VIEW MENU using the arrows   (Figure 3-4).
- 3) Use the arrows   to select the trigger timing.




Figure 3-4 TRIGGER

START	Start trigger
CENTER	Center trigger
END	End trigger
+000%	Custom trigger

- i) If selecting custom trigger, use the cursor and press SET .
- ii) Move using the arrows   and use arrows   to change the numerals (-100~+100).
- iii) Press SET  again to set the trigger timing.



Selection of trigger timing using the direct key  is possible when the status screen is displayed in the STOP mode or the VIEW mode.

The custom trigger setting values cannot be changed with the direct key.

3.2.1.1 Start Trigger

With the start trigger, it is possible to record the number of frames corresponding to 95% of the recording time from trigger input to the end of recording. (Figure 3-5)

This is a valid setting when recording the current image from direct trigger input.

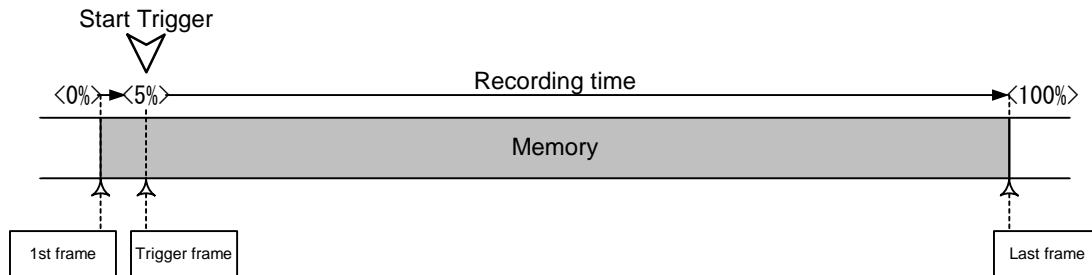


Figure 3-5 Recording with the Start Trigger

3.2.1.2 Center Trigger

With the center trigger, it is possible to record the number of frames for half of the recording time before and after trigger input. (Figure 3-6)

This is a valid setting when recording the current image from before and after the time of trigger input.

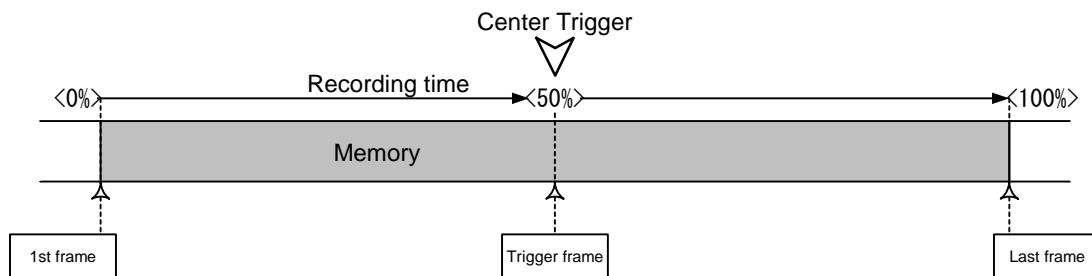


Figure 3-6 Recording with the Center Trigger

3.2.1.3 End Trigger

With the end trigger, it is possible to record the number of frames corresponding to 95% of the recording time from the beginning of recording to trigger input. (Figure 3-7)

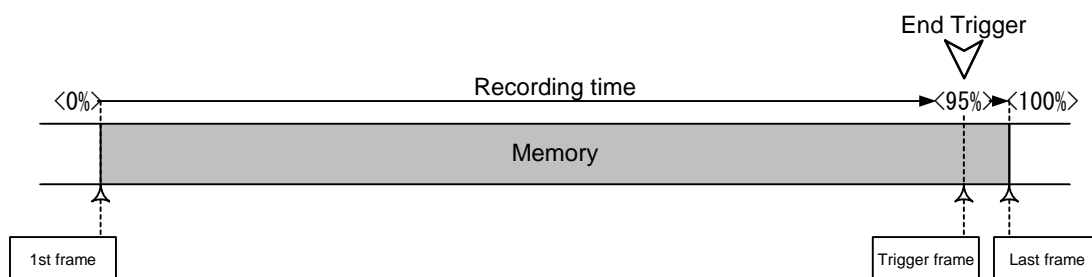


Figure 3-7 Recording with the End Trigger

3.2.1.4 Custom Trigger

If setting a positive number with the custom trigger, the number of frames recorded from the start of recording to trigger input and the number of frames recorded from trigger input to the end of recording can be setting as desired. The trigger timing can be set in 1% intervals.

Figure 3-8 shows a case when the trigger timing is set at +25%.

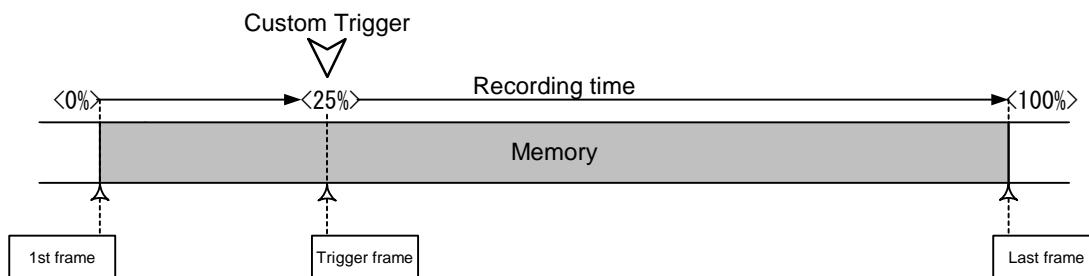


Figure 3-8 Recording with the Custom Trigger (+25%)

If setting negative numbers, it functions as a delay trigger.

For example, if the trigger timing is set as -100%, after trigger input, recording starts when the recording possible time and the same time have elapsed. (Figure 3-9)

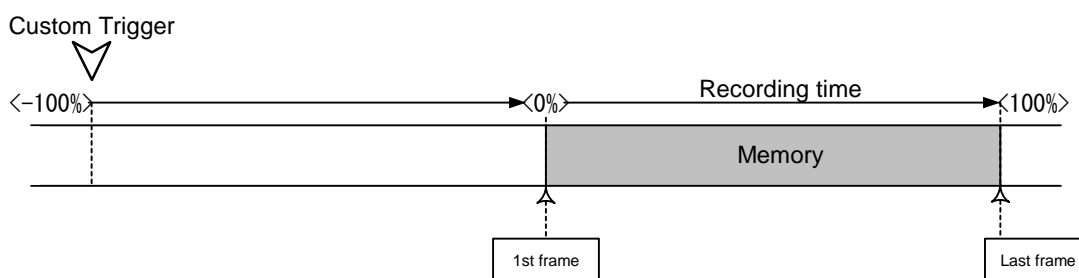





Figure3-9 Recording with the Custom Trigger (-100%)

3.2.2 Recording Speed Selection (FRM RATE)

While in the VIEW mode, the recording speed can be selected from the VIEW MENU on the J-PAD3. The recording speed can also be selected with the direct key.

- 1) While in the VIEW mode, press  to display the VIEW MENU.
- 2) Select "FRM RATE" from the VIEW MENU using the arrows  . (Figure 3-10).



Use the arrows   to select the recording speed.



Figure3-10 FRM RATE

50	50 pps (picture per second)
60	60 pps
100	100 pps
250	250 pps
500	500 pps
750	750 pps
1000	1,000 pps
1500	1,500 pps
2000	2,000 pps
2500	2,500 pps
3000	3,000 pps
4000	4,000 pps
5000	5,000 pps
6000	6,000 pps
7000	7,000 pps
8000	8,000 pps
10000	10,000 pps
15000	15,000 pps
20000	20,000 pps
30000	30,000 pps
40000	40,000 pps
50000	50,000 pps
60000	60,000 pps
80000	80,000 pps
100000	100,000 pps
150000	150,000 pps
198000	198,000 pps

FRMRATE



Selection of recording speed using the direct key is possible when the status screen is displayed in the STOP mode or the VIEW mode.

Refer to **[7.2.3 Recording Times]** for the frame size and recording time that can be set for each recording speed.

3.2.3 Frame Size Selection (FRM SIZE)

While in the VIEW mode, the frame size can be selected from the VIEW MENU on the J-PAD3.






- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Select "FRM SIZE" from the VIEW MENU using the arrows   (Figure 3-11).
- 3) Use the arrows   to select the frame size.



Figure 3-11 FRM SIZE







	Horizontal pixels (H)	x	Vertical pixels (V)
1280 x 1024	1280(H)	x	1024(V) pixel
1280 x 960	1280(H)	x	960(V) pixel
1280 x 800	1280(H)	x	800(V) pixel
1280 x 720	1280(H)	x	720(V) pixel
1152 x 864	1152(H)	x	864(V) pixel
1024 x 1024	1024(H)	x	1024(V) pixel
1024 x 768	1280(H)	x	768(V) pixel
1024 x 576	1280(H)	x	576(V) pixel
896 x 672	896(H)	x	672(V) pixel
800 x 800	800(H)	x	800(V) pixel
768 x 576	768(H)	x	576(V) pixel
704 x 704	704(H)	x	704(V) pixel
704 x 528	704(H)	x	528(V) pixel
624 x 624	624(H)	x	624(V) pixel
640 x 480	640(H)	x	480(V) pixel
512 x 512	512(H)	x	512(V) pixel
512 x 384	512(H)	x	384(V) pixel
452 x 368	452(H)	x	368(V) pixel
436 x 192	436(H)	x	192(V) pixel
384 x 288	384(H)	x	288(V) pixel
320 x 240	320(H)	x	240(V) pixel
320 x 192	320(H)	x	192(V) pixel
256 x 192	256(H)	x	192(V) pixel
192 x 144	192(H)	x	144(V) pixel
144 x 144	144(H)	x	144(V) pixel
128 x 128	128(H)	x	128(V) pixel
96 x 96	96(H)	x	96(V) pixel
64 x 64	64(H)	x	64(V) pixel
64 x 32	64(H)	x	32(V) pixel
16 x 64	16(H)	x	64(V) pixel
4 x 16	4(H)	x	16(V) pixel

Frame size is limited to the sizes that can be set according to the selected recording speed. Refer to **【7.2.3 Recording Times】** for the frame sizes and recording times that can be set for each recording speed.







3.2.4 Custom Settings for Recording Speed and Frame Size (CUSTOM F)


While in the VIEW mode, the desired value for the recording speed and frame size can be selected from the VIEW MENU on the J-PAD3.







- Custom Settings for Recording Speed
The recording speed can be set at 1pps intervals. With frame size priority, the upper limit of the recording speed is determined by the frame size.
- Custom Settings for Frame Size
Horizontal pixels can be set in 4 pixel intervals while vertical pixels can be set in 16 pixel intervals. With recording speed priority, the upper limit of the frame size is determined by the recording speed

- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Select "CUSTOM F" from the VIEW MENU using the arrows   and press SET  to display the CUSTOM F sub-menu (Figure 3-12).
- 3) Select "PRIORITY" and then use the arrows   to select either the recording speed or the frame size as priority (Figure 3-13).

RATE	Recording speed priority
SIZE	Frame size priority

- 4) Select "FRM RATE" for recording speed custom settings.
 - i) Select "FRM RATE" and press SET  (Figure 3-14).
 - ii) Use arrows   to move columns and use arrows   to change the numerical value.
 - iii) Press SET  to set the recording speed.

With frame size priority, to set a value larger than the upper limit for the recording speed, press  to display the value for the upper limit.

- 5) Select "FRM SIZE" for the frame size custom settings.
 - i) Select "FRM SIZE" and press SET  (Figure 3-15).
 - ii) Use arrows   to change the number of horizontal pixels and arrows   to change the number of vertical pixels.
 - iii) Press SET  again to set the frame size.


With recording speed priority, to set a value larger than the upper limit for the frame size, press SET  to display the value of the upper limit.



Figure3-12 CUSTOM F

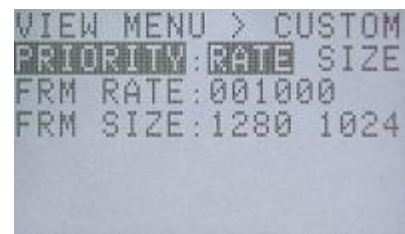


Figure 3-13 PRIORITY








Figure 3-14 FRM RATE(Custom)



Figure 3-15 FRM SIZE

3.2.5 Shutter Exposure Time Selection (SHUTTER)

While in the VIEW mode, the shutter exposure time can be selected from the VIEW MENU on the J-PAD3. The shutter exposure time can be selected from either set values or desired values can be set.

- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Select "SHUTTER" from the VIEW MENU using the arrows  . (Figure 3-16).
- 3) Use the arrows   to select the shutter exposure time.

OPEN	1/ recording speed sec
100	1/ 100 sec
250	1/ 250 sec
500	1/ 500 sec
1 k	1/ 1000 sec
2 k	1/ 2000 sec
5 k	1/ 5000 sec
10 k	1/ 10,000 sec
20 k	1/ 20,000 sec
50 k	1/ 50,000 sec
100 k	1/ 100,000 sec
200 k	1/ 200,000 sec
333 k	1/ 333,333 sec



Figure 3-16 SHUTTER








- 4) The left preset value shows 6 numerical columns "*****us". Select for the custom settings for the shutter exposure time.
 - i) Select "*****us" and press SET .
 - ii) Use arrows   to change columns and use arrows   to change the numerals. (Figure 3-17) .
 - iii) Press SET  again, to set the shutter exposure time.



Figure 3-17 SHUTTER (Custom)

The upper limit for the shutter exposure time is set according to the recording speed. To set a value greater than the shutter exposure time, press SET  to display the value of the upper limit.

The values that can be used as custom settings for the shutter exposure time change according to the recording speed and frame size. When SET  is pressed, the display of the possible settings changes.

CAUTION) Black balance adjustment is recommend when you use a shutter of 1~5 μ s as black level changes dramatically.



Selection of the shutter exposure time using the direct key can be performed when the status screen in the STOP mode or the VIEW mode is displayed.






The custom settings for the shutter exposure time cannot be changed with the direct key

3.2.6 Area Of Interest (AOI)

In case of use of auto exposure (AE) mode or image trigger (IMG TRIG) mode, you should specify a reference area where luminance level is measured. Area of interest (AOI) is used for specifying the said reference area.

Note: AOI is called as AE AREA on the J-Pad 3 ver.2.02 or earlier.

In the VIEW mode, you can set AOI from VIEW MENU of J-PAD3, as follows.

- 1) In the VIEW mode, press  to enter the VIEW MENU.
- 2) Select "AOI" from the VIEW MENU using the up/down keys  . (Figure 3-18).
- 3) Use the left/right keys   to select the area of interest.

FULL	AOI is the whole image.
CENTER	AOI is a central part of the image. (25% of area)
UPPER	AOI is an upper half of the image.
LOWER	AOI is a lower half of the image.
LEFT	AOI is a left half of the image.
RIGHT	AOI is a right half of the image.
CUSTOM	AOI specified by GXLink (*).



Figure 3-18 AOI

- * Custom AOI: You can specify AOI in pixels by pixels using the GXLink. You can choose "CUSTOM" mode by the J-PAD3 but cannot specify its area by the J-PAD3. Please refer to GXLink User's Manual for the custom AOI setting procedure.

3.2.7 Image Trigger (IMG TRIG) Setting

In the VIEW mode, you can set the IMG TRIG from the VIEW MENU on the J-PAD3.

Image trigger is a function to activate as a trigger when the luminance is changed in the area specified in AOI. However, the image trigger is not activated in case of the gradual luminance change, such as, weather change. In addition, it monitors the luminance level at 7.5Hz (NTSC mode) or 6.25Hz (PAL mode). So, it may not be activated in case of a short duration of luminance change, such as, a flash of 0.2sec or less.

When using the image trigger mode, you should set AOI (see 3.2.6) and an image trigger level.

In the VIEW mode, you can set an image trigger level by J-PAD3, as follows.






- 1) In the VIEW mode, press MENU  to enter the VIEW MENU.
- 2) Select "IMAG TRIG" from the VIEW MENU using the up/down keys  . (Figure 3-19)
- 3) Use the left/right keys   to select the image trigger level.



Figure 3-19 IMG TRIG

OFF	Image trigger is off.
LOW	Insensitive: The trigger is activated by large change of luminosity.
MID	Standard: The trigger is activated by medium change of luminosity.
HIGH	Sensitive: The trigger is activated by small change of luminosity.

If the image trigger level is not suitable for the recording condition, the trigger is activated unexpectedly [A] or is not activated as per your expectation [B]. Please try test recordings before the actual test, to check the image trigger level. Following is reference to find a suitable image trigger level.

Setting	Suitable Conditions	Not Suitable Conditions	Impossible Conditions
LOW	<ul style="list-style-type: none"> Recording under flickering environment such as under a fluorescence 	<ul style="list-style-type: none"> Recording in case of small luminance change [B] 	<ul style="list-style-type: none"> Recording under flickering environment such as under a fluorescence. [A]
MID	<ul style="list-style-type: none"> Recording in case of luminance change entirely in AOI, such as an explosion 	<ul style="list-style-type: none"> Recording if size of a subject crossing AOI is not sufficient against AOI. [B] 	
HIGH	<ul style="list-style-type: none"> Recording if a subject will cross in AOI 	<ul style="list-style-type: none"> Recording if there will be a moving object in AOI other than a subject [A] 	

You cannot use IMG TRIG mode and AE mode simultaneously. If you will set IMG TRIG mode while AE mode is activated, a warning message will be displayed as shown in Fig. 3-20.


Press the SET key  to switch from AE mode to IMG TRIG mode.



Figure 3-20

While IMG TRIG mode is activated, "Image Trigger" is displayed on the OSD (on screen display) in VIEW, ARM, and REC, as shown in Fig. 3-21.



Figure3-21






Cautions) In case of not use of the image trigger function, please make sure that IMG TRIG is OFF. If IMG TRIG is not OFF while you want to use the external trigger signal or the trigger command from the J-PAD3, the recording may be completed unexpectedly due to this function.

3.2.8 Automatic Exposure (AE) Control Settings

While in the VIEW mode, the automatic exposure control can be set from the VIEW MENU on the J-PAD3.

The automatic exposure control (AEC : Automatic Exposure Control) measures the light in a specific area of the image photographed and adjusts the shutter exposure time for the appropriate brightness of the image. This corresponds to brightness changes outdoors (fog, time and changes in the weather). The response speed for the automatic exposure is set to be slower and so this cannot be used during rapid changes in brightness (strobe lights or explosions and the like).

When using the automatic exposure control, the shutter exposure time is adjusted between the shortest exposure time and the exposure time set as a SHUTTER item. If the time stamp is ON, the value of the shutter exposure time for the recorded frame is saved for each frame.

- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Select "AE" from the VIEW MENU using the arrows  .
- 3) Use arrows   to select the adjustment level for the automatic exposure control.

OFF	Automatic exposure control not in use
LOW	Image brightness adjusted slightly darker
NORMAL	Image brightness adjusted to normal
HIGH	Image brightness adjusted slightly brighter








Figure 3-22 AE

3.2.9 DRES Mode Settings (DRES)

While in the VIEW mode, the DRES mode can be set from the VIEW MENU on the J-PAD3.

Using the DRES mode, (DRES : Dynamic Range Expansion Shutter) , the camera sensor can control the saturation of the area of high intensity to enable photography of wide dynamic range images.

DRES mode is used as a combination of gamma correction and lens adjustment. When in DRES mode, gain correction and knee correction do not function.

- 4) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 5) Select "DRES" from the VIEW MENU using the arrows  .
- 6) Use the arrows   to select the dynamic range in DRES mode.

OFF	The dynamic range is set to approximately 200%. (This is the normal setting)
LOW	The dynamic range is set to approximately 400%
MID	The dynamic range is set to approximately 800%
HIGH	The dynamic range is set to approximately 1600%



Figure3-23 DRES

3.2.10 Recording Bit Length Settings (DEPTH)

While in the VIEW mode, the recording bit length can be set from the VIEW MENU on the J-PAD3.

It is possible to alter the number of bits per pixel for the recorded image. With a high bit rate, the gradation of the image (the amount of change in brightness) of the image is finer and results in better image quality. With a low bit rate, the gradation of the image is rougher and it is possible to economize on the recording memory, and extend the recording time.






- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Select "DEPTH" from the VIEW MENU using the arrows  . (Figure 3-24)
- 3) Use the arrows   to select the recording bit length.



Figure3-24 DEPTH

- | | |
|----|---------------------------------|
| 8 | 8 bit |
| 10 | 10 bit (standard image setting) |
| 12 | 12 bit (high quality image) |

3.2.11 Initial Value Settings for the Recorded Scene Number (SCENE)

While in the VIEW mode, the initial value for the recorded scene number can be set from the VIEW MENU on the J-PAD3.

The initial value for the recorded scene can be set from 0~65535. The recorded scene number adds +1 each time recording is completed.










- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Select "SCENE" from the VIEW MENU using the arrows   and press SET . (Figure 3-25) .
- 3) Use the arrows   to move columns and use arrows   to change the numerical value. (Range : 0~65535)
- 4) Press SET  again to set the initial value for the recorded scene number.



Figure3-25 SCENE







3.2.12 Memory Segment Settings (SEG SIZE)

While in the STOP mode, the number of memory segments can be set from the SYS MENU on the J-PAD3.

The recording memory can be segmented into a maximum of 16 memory segments (4GB Model). The recording time for segmented memory segments shortens according to the number of segments but separate recording scenes can be saved for the number of segments. Also, the recorded images for multiple scenes can be retained and downloaded together afterwards.

The photographic conditions for each memory segment can be changed for recording.

CAUTION) Images recorded in the memory are erased when the memory segments are set. Conduct memory segmenting after verifying whether or not erasing is acceptable.
The images required should be shaved on USB compatible recording media or on the control PC. Refer to **【2.9 Saving】** or **【GXLink User's Manual】** for the method of saving images.

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Select "SYS SET" from the TOP MENU using the arrows   and press SET  to display the SYS SET sub-menu (Figure 3-26) .
- 3) Select "SEG SIZE" and select the number of memory segments using the arrows  .

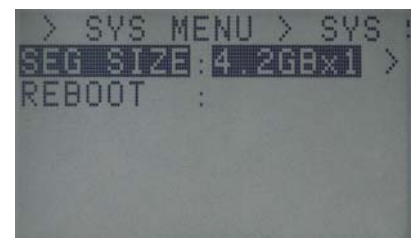



Figure 3-26 SYS SET

<Memory 2GB model>

- 2.1GBX1 No memory segmentation
- 1GBX2 Segment into two 1GB segments
- 532MB X4 Segment into four 512MB segments
- 266MB X8 Segment into eight 256MB segments

<Memory 4GB model>

- 4.2GBX1 No memory segmentation
- 2.1GBX2 Segment into two 2.1GB segments
- 1GBX4 Segment into four 1GB segments
- 532MB X8 Segment into eight 512MB segments
- 266MB X16 Segment into sixteen 256MB segments

- 4) Once the number of memory segments is selected, a verification message verifying the memory segmentation will be displayed (Figure 3-27).
If there are no problems erasing the images saved in the memory, press SET  to segment the memory.

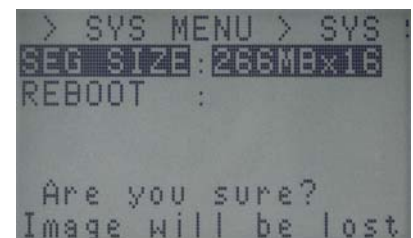








Figure 3-27 Verification message

3.2.13 External Trigger Signal Selection (TRIG SEL)

While in the STOP mode, the external trigger signals can be set from the SYS MENU on the J-PAD3.

The method of inputting the recording trigger signals can be performed by operating the special remote control J-PAD3 or via external trigger signal input from the TRIG1 connector on rear panel or the J3 cable TRIG2 connector.

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Select "TRIG SET" from the TOP MENU using the arrows   and press SET  to display the TRIG SET sub-menu (Figure 3-28) .
- 3) Select "TRIG SEL" and use the arrows   to select the external trigger signal.

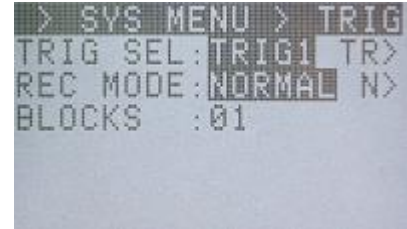


Figure3-28 TRIG SEL(TRIG SET)

TRIG1	Valid external trigger signal from TRIG1 connector
TRIG2	Valid external trigger signal from TRIG2 connector

External trigger signals from the J1 cable TRIG1 connector and the J3 cable TRIG2 connector cannot be used simultaneously.

The polarity of the external trigger signals from the TRIG1 connector and TRIG2 connector can be set. Refer to **【3.2.16 Selecting Polarity for External Input/Output Signals】**

3.2.13.1 External Trigger Signals from TRIG1

External trigger signal from the TRIG1 connector is input into the MEMRECAM GX-3 via TTL input or contact input. Refer to **【7 Specifications】** for details.

The advantage of using these signals is the ease of use and with contact input, connection is possible between one switch and two wires. It is recommended that this be used in a clean environment where there is no external noise. Please be aware that the voltage tolerance range is quite narrow (-0.5~5.5Vdc)

3.2.13.2 External Trigger Signals from TRIG2

External trigger signal from the TRIG1 connector is input into the MEMRECAM GX-3 via current loop input by the photo coupler. Refer to **【7 Specifications】** for details.

The advantage of using these signals is the excellent noise resistance and the application for long distance cables. It is recommended that this be used in an environment where noise, such as static is often generated. However, an external power source is needed to use this input.

3.2.13.3 Filter Value Setting

If trigger is ON by noise through an external trigger signal line, set the value of the noise filter to avoid mis-trigger. Please refer to **【3. 2.17 Trigger filter setting】** for details of the setting procedure.

3.2.14 Recording Method Selection (REC MODE)

While in the STOP mode, the recording method can be selected from the SYS MENU on the J-PAD3.

Select the optimal recording method for our photography from the four choices below. Recording can be performed in the AUTO mode, LOOP mode, ALL BLOCKS mode (only with multi trigger recording) and CONTINUOUS mode (only with multi trigger recording) for each recording method.

- **Normal Recording** [NORMAL / NORMAL(A) / NORMAL(L)]
- **Burst Recording** [BURST / BURST(A) / BURST(L)]
- **Multi Trigger Recording** [MULTI(A) / MULTI(C) / MULTIS(A) / MULTIS(L)]
- **Event Recording** [EVENT / EVENT(A) / EVENT(L)]

Please be aware that depending on the recording method, there may be cases when the trigger input from the J-PAD3 does not function. Trigger input from external trigger signals works for all recording methods. (Table 3-4)

Table 3-4 Valid Trigger Input by Recording Method

Recording Method	Trigger Input	
	J-PAD3 operation	External Trigger Signals
Normal Recording	○	○
Burst Recording	×	○
Multi Trigger Recording	○	○
Event Recording	△	○

× : Trigger input from the J-PAD3 does not work with burst recording.

△ : With event recording, the initial trigger input does not work from the J-PAD3 and the external trigger input only works with the second and subsequent event trigger input.

3.2.14.1 AUTO Mode

The AUTO mode has a function that automatically performs memory segment switching when recording stops and switching from the REC mode to the ARM mode. Continuous recording for each memory segment. The STOP mode is accessed once recording to all of the memory segments has been completed.

Memory segments where recording has been completed are memory protected, and recording is prohibited in AUTO mode. If the J-PAD3 is used to switch to the ARM mode, a warning message will be displayed (Figure 3-29).

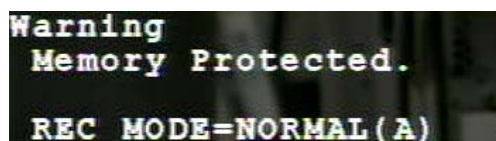








Figure 3-29 Memory Protected

Even if recording to all of the memory segments has not been completed, press STOP  to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.

- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.







3.2.14.2 LOOP Mode

The LOOP mode has a function that automatically performs memory segment switching when recording stops and switching from the REC mode to the ARM mode. It is different from the AUTO mode in that there is no memory protection for memory segments upon the completion of recording. Images are overwritten when memory segments are switched so repeated recording can be performed.

Recording is repeated until STOP  is pressed..

CAUTION) It takes about 4.5 seconds for the automatic switching of memory segments. Since trigger input during this time may be ignored, input the trigger after verifying that you are in the ARM mode.

3.2.14.3 Setting Method

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Select "TRIG SET" from the TOP MENU using the arrows   and press SET  to display the TRIG SET sub-menu (Figure3-30).
- 3) Select "REC MODE" and use the arrows   to select the recording method.

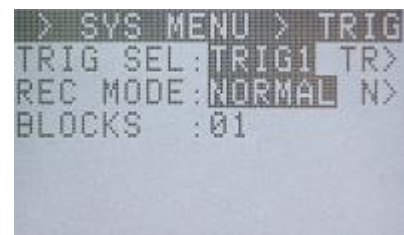








Figure 3-30 REC MODE(TRIG SET)

NORMAL	Normal recording
NORMAL(A)	Normal recording in AUTO mode
NORMAL(L)	Normal recording in LOOP mode
EVENT	Event recording
EVENT(A)	Event recording in AUTO mode
EVENT(L)	Event recording in LOOP mode
BURST	Burst recording
BURST(A)	Burst recording in AUTO mode
BURST(L)	Burst recording in LOOP mode
MULTI(A)	Multi trigger recording in ALL BLOCKS mode
MULTI(C)	Multi trigger recording in CONTINUOUS mode
MULTIS(A)	Multi trigger recording in AUTO mode
MULTIS(L)	Multi trigger recording in LOOP mode

- 4) When selecting multi trigger recording, select "BLOCKS" to set the number of memory block segments.
 - i) Select "BLOCKS" and press SET .
 - ii) Use arrows   to move columns and use arrows   to change the numerical value (1~16).
 - iii) Press SET  again to set the number of blocks for multi trigger recording.

3.2.14.4 Normal Recording

Normal recording is the recording method that saves images to the appropriate memory segment for a single trigger input. The three modes within normal recording include NORMAL, NORMAL(A) and NORMAL(L). Refer to **【3.2.14.3 Setting Method】** for the method of setting normal recording.

Next is the recording sequence for each mode.

3.2.14.4.1 NORMAL

Figure 3-31 shows how to switch modes with the J-PAD3 during normal recording (top of the figure) and saving in the memory (bottom of the figure).

The sequence for segmenting the memory into four memory segments and performing normal recording for memory segment 1 is shown below.

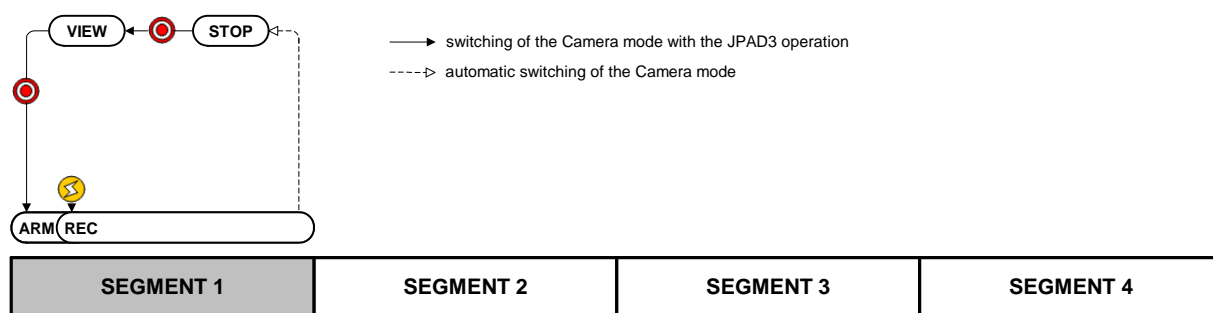










Figure 3-31 Normal Recording (NORMAL, number of segments : 4)

- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
 - 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.
 - 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
 - 4) While in the ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to the REC mode. Recording will end according to the set trigger timing.
 - 5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches from the REC mode to the STOP mode.
- * Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.
- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
 - If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.14.4.2 NORMAL(A)

Figure 3-32 shows how to switch modes with the J-PAD3 during NORMAL(A) recording (top of the figure) and saving in the memory (bottom of the figure).

NORMAL(A) refers to normal recording in AUTO mode.

The sequence for segmenting the memory into four memory segments and performing NORMAL(A) recording for memory segment 1 is shown below. The memory should be empty before recording is started.

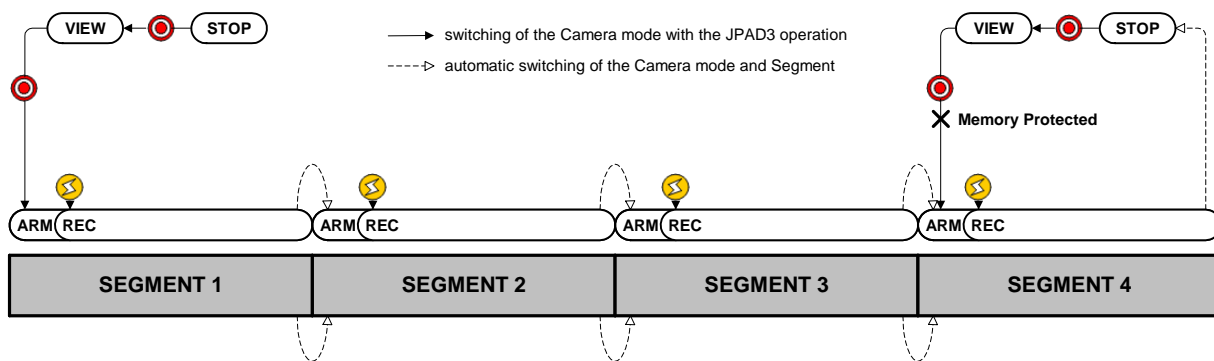











Figure 3-32 Normal Recording (NORMAL(A), Number of Segments : 4)

- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
 - 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode. The memory segment number (SEG) superimposed on the image is displayed as "A". Settings in AUTO mode are displayed. 
 - 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
 - 4) While in the ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to the REC mode. Recording will end according to the set trigger timing.
 - 5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from the REC mode to the ARM mode.
 - 6) Recording in 4)~5) is repeated, and once recording to all of the memory segments has been completed, it switches from the REC mode to the STOP mode. It does not switch automatically after recording on the last memory segment (SEGMENT4).
 - 7) Memory segments where recording has been completed are memory protected so will not switch to the ARM mode. If you wish to start recording again, either change the setting to a recording method other than the AUTO mode, or erase a memory segment.
- * Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.
- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
 - If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.14.4.3 NORMAL(L)

Figure 3-33 shows how to switch modes with the J-PAD3 during NORMAL(L) recording (top of the figure) and saving in the memory (bottom of the figure). NORMAL(L) refers to normal recording in LOOP mode.

The sequence for segmenting the memory into four memory segments and performing NORMAL(L) recording for all of the memory segments is shown below.

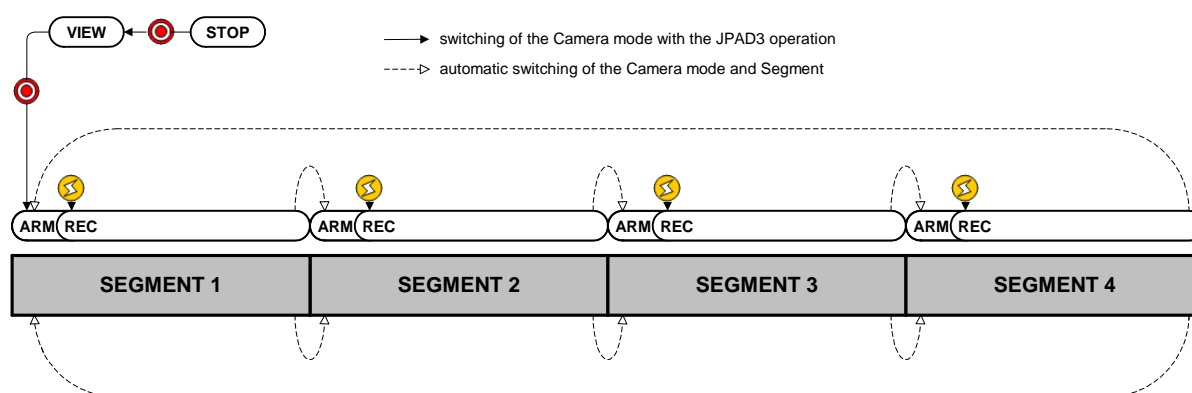












Figure 3-33 Normal Recording (NORMAL(L), Number of Segments : 4)

- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.
The memory segment number (SEG) superimposed on the image is displayed as "L". Settings in LOOP mode are displayed.
- 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
- 4) While in the ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to the REC mode. Recording will end according to the set trigger timing.
- 5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from the REC mode to the ARM mode.
- 6) Recording in 4)~5) is repeated, and once recording to all of the memory segments has been completed, it switches to the top memory segment (SEGMENT1) and it automatically switches from the REC mode to the ARM mode.



The recording operation in 6) can be repeated while subsequent images are overwritten. Press STOP  to stop recording.

- * Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.
- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
 - If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.14.5 Burst Recording

With burst recording, the frame for the amount of recording time is controlled with burst trigger signals and saved in the memory.

Burst trigger signals can save only the desired frames from the period recorded in the memory. As shown in Figure 3-31, only the frames during the period when the burst trigger signals are input (ON) are saved to the memory.

Also, the recording memory is segmented into blocks according to the burst trigger signal input time frame. When the total of the frames saved in each block reaches the number of frames for each recording time, recording is completed.

Figure 3-31 shows the number of frames for each recording time saved with three burst trigger signal inputs.

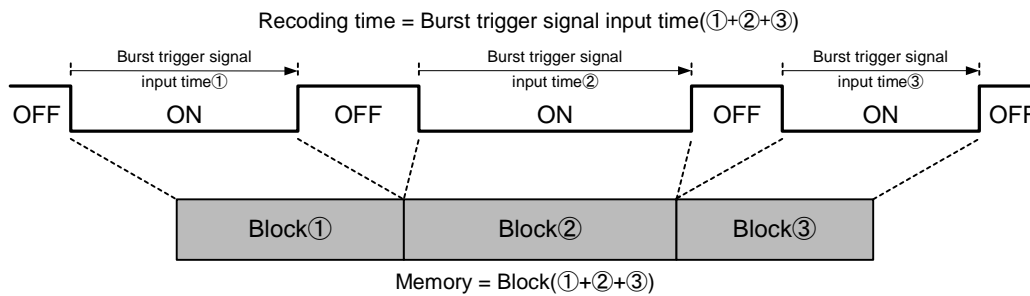


Figure 3-34 Burst Recording

The three modes within burst recording include BURST, BURST (A) and BURST (L). Refer to **【3.2.14.3 Setting Method】** for the method of setting burst recording.

Next are the restrictions on burst recording and the recording sequence for each mode.

3.2.14.5.1 Burst Recording Restrictions

The following restrictions apply to burst recording.

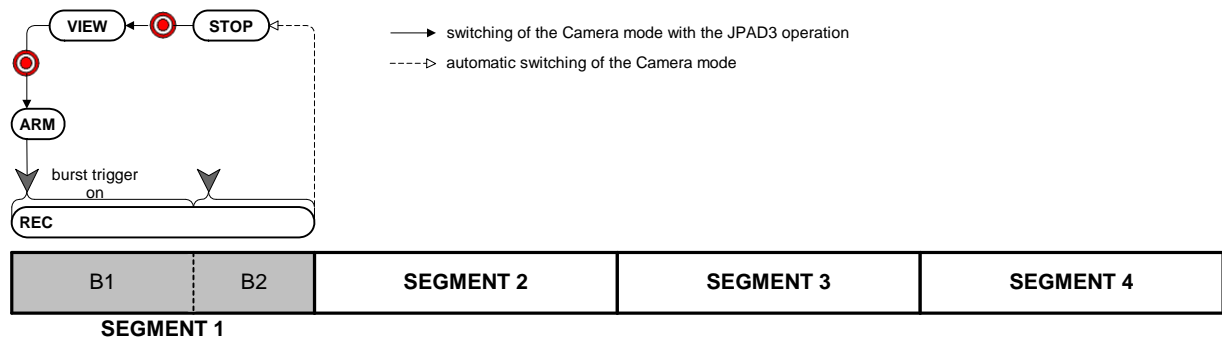
- Burst recording cannot be combined with multi trigger recording and event recording. Recording can be combined with EST synchronized signal recording.
- Trigger input does not work with the J-PAD3 during burst recording. Input burst recording signals from the TRIG1 connector on the rear panel or the J3 cable TRIG2 connector.
- Burst recording signals can be input 16 times in the appropriate memory segment. If the time stamp is ON and the frame time standard is set to the exposure time, the restrictions on the number of burst recording signals is eliminated but during playback, it can jump to the top frame of each block up to 16 times.

Refer to **【5 System setting】** for **【3.2.19 TIMESTAMP Setting】**, and a setting of flame time about a setting of a time and date stamp.

3.2.14.5.2 BURST

Figure 3-35 shows how to switch modes with the J-PAD3 during burst recording (top of the figure) and saving in the memory (bottom of the figure). B1 and B2 refer to the blocks of segmented memory corresponding to the burst trigger signals.

The sequence for segmenting the memory into four memory segments and performing burst recording for memory segment 1 is shown below.









- 1) Verify that the MEMRECAM GX- is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.

The frame counter (FRAME) superimposed on the image is displayed as "B". Burst recording settings are displayed.

"BURST" is displayed for trigger timing (Trigger).



- 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode.
During burst recording, images cannot be overwritten, even in ARM mode. Also, live images cannot be updated.
 - 4) While in the ARM mode, input the burst trigger signals from the TRIG1 connector on rear panel or the J3 cable TRIG2 connector to switch to the REC mode.
Images are saved only when the burst trigger signal is ON, and when live images are updated.
Recording ends after the number of frames for the appropriate memory segment (SEGMENT1) are saved.
 - 5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the STOP mode from the REC mode.
- * Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.
- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
 - If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.1 4.5.3 BURST(A)

Figure 3-36 shows how to switch modes with the J-PAD3 during BURST(A) recording (top of the figure) and saving in the memory (bottom of the figure). BURST(A) refers to burst recording during the AUTO recording. B1, B2, B3 and B4 refer to the blocks of segmented memory corresponding to the burst trigger signals.

The sequence for segmenting the memory into four memory segments and performing BURST(A) recording for all of the memory segments is shown below. The memory should be empty before recording is started.

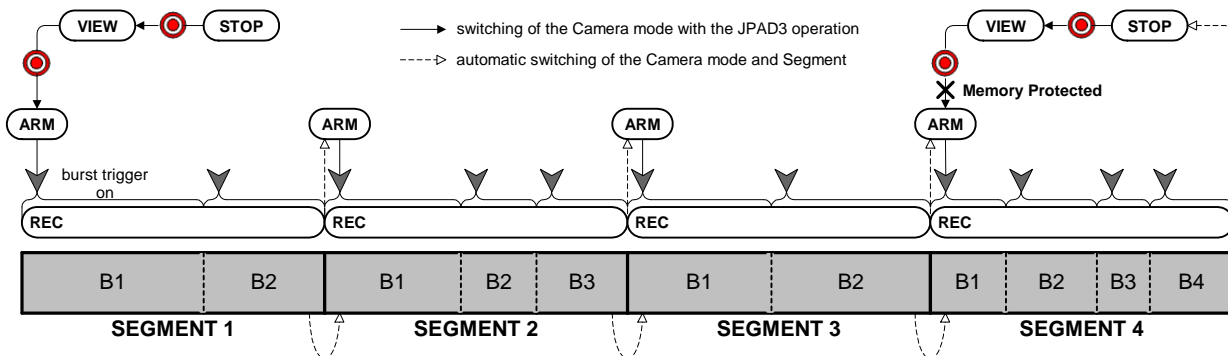


Figure 3-36 Burst Recording (BURST(A), Number of Segments : 4)

- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.


The memory segment number (SEG) superimposed on the image is displayed as "A". Settings in AUTO mode are displayed.








"B" is shown in the frame counter (Frame). Burst recording settings are displayed.



"BURST" is displayed for trigger timing (Trigger).

- 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode.
During burst recording, images cannot be overwritten, even in ARM mode. Also, live images cannot be updated.
- 4) While in the ARM mode, input the burst trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to switch to the REC mode.
Images are saved only when the burst trigger signal is ON, and when live images are updated. Recording ends after the number of frames for the appropriate memory segment (SEGMENT1) are saved.
- 5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from the REC mode to the ARM mode.
- 6) Recording in 4)~5) is repeated, and once recording to all of the memory segments has been completed, it switches from the REC mode to the STOP mode. It does not switch automatically after recording on the last memory segment (SEGMENT4).
- 7) Memory segments where recording has been completed are memory protected so will not switch to the ARM mode. If you wish to start recording again, either change the setting to a recording method other than the AUTO mode, or erase a memory segment.

* Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.

- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.14.5.4 BURST(L)

Figure 3-37 shows how to switch modes with the J-PAD3 during BURST(L) recording (top of the figure) and saving in the memory (bottom of the figure). BURST(L) refers to burst recording in LOOP mode. B1, B2, B3 and B4 refer to memory segmented blocks that correspond to the burst trigger signals.

The sequence for segmenting the memory into four memory segments and performing BURST(L) recording for all of the memory segments is shown below.

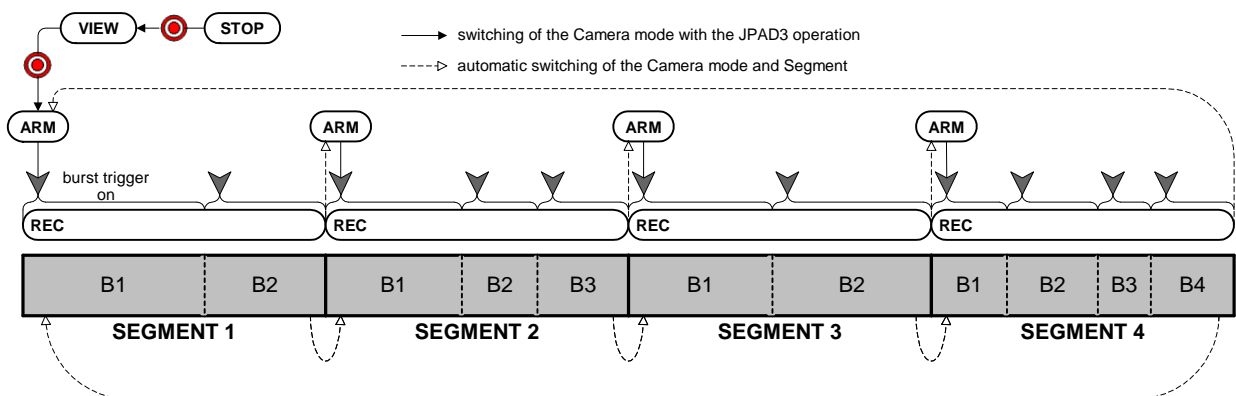


Figure3-37 Burst Recording (BURST(L), Number of Segments : 4)

- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.

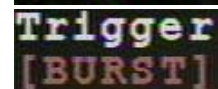
The memory segment number (SEG) superimposed on the image is displayed as "L". Settings in LOOP mode are displayed.




"B" is shown in the frame counter (Frame). Burst recording settings are displayed.









"BURST" is displayed for trigger timing (Trigger).



- 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode.
During burst recording, images cannot be overwritten, even in ARM mode. Also, live images cannot be updated.
- 4) While in the ARM mode, input the burst trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to switch to the REC mode.
Images are saved only when the burst trigger signal is ON, and when live images are updated.
Recording ends after the number of frames for the appropriate memory segment (SEGMENT1) are saved.

- 5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from the REC mode to the ARM mode.
- 6) Recording in 4)~5) is repeated, and once recording to all of the memory segments has been completed, it switches to the top memory segment (SEGMENT1) and automatically switches from the REC mode to the ARM mode.

The recording operation in 6) can be repeated while subsequent images are overwritten. Press STOP  to stop recording.

- * Press STOP  to stop recording, even when recording to the appropriate memory segment has not been completed. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.
 - If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
 - If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.14.6 Multi Trigger Recording

With multi trigger recording, the appropriate memory segments can be segmented into a maximum of 16 uniform blocks. Triggers are input for each block and multiple images can be recorded separately.

Also, each time recording to blocks is completed, the blocks are switched and it automatically switches from the REC mode to the ARM mode (ALL BLOCKS mode).

The four modes within multi trigger recording include MULTI(A), MULTI(C), MULTIS(A), and MULTIS(L). Refer to **[3.2.14.3 Setting Method]** for the multi trigger recording settings and the settings for the number of segmented blocks.

Next are the restrictions on multi trigger recording and the recording sequence for each mode.

3.2.14.6.1 Multi Trigger Recording Restrictions

The following restrictions apply to multi trigger recording.

- Multi trigger recording cannot be combined with burst recording and event recording. Recording can be combined with EST synchronized signal recording.
- Automatic block switching takes about 2.5 seconds. Triggers input during this period may be ignored so use trigger input after verifying that you are in the ARM mode.

3.2.14.6.2 MULTI(A)

The (A) in MULTI(A) indicates the “ALL BLOCKS” mode. In the ALL BLOCKS mode, once recording to all of the blocks in the appropriate segment has been completed, it switches to the STOP mode.

The ALL BLOCKS mode is a basic operation of multi trigger recording. MULTI(C), MULTIS(A) and MULTIS(L) recording can also be used.

Figure 3-38 shows how to switch modes with the J-PAD3 during MULTI(A) recording (top of the figure) and saving in the memory (bottom of the figure).

The sequences for setting two memory segments and four blocks, and for MULTI(A) recording to memory segment 1 are shown below.

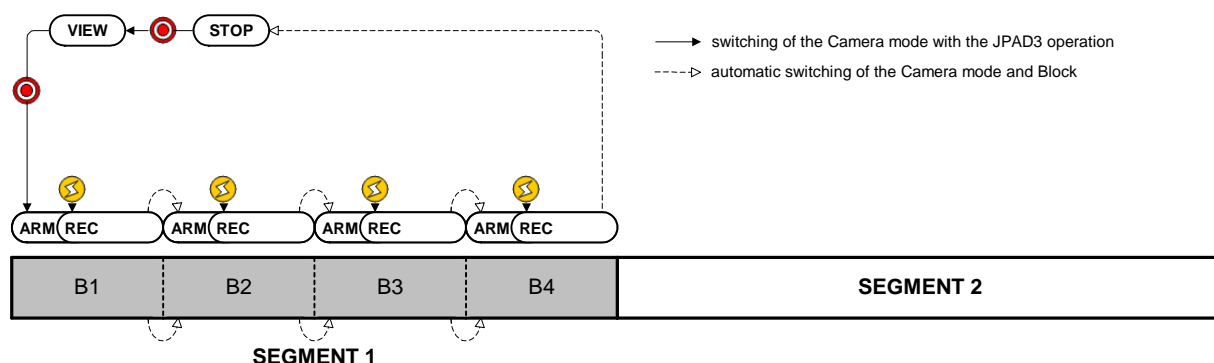












Figure 3-38 Multi Trigger Recording (MULTI(A), Number of Segments: 2, Number of Blocks: 4)

- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
 - 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.
The frame counter (FRAME) superimposed on the image shows "04 A". There are 4 blocks displaying the ALL BLOCKS mode setting. 
 - 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode.
The frame counter (Frame) displays "01 A". While the images are overwritten to block 1, it awaits trigger input. 
 - 4) While in the ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to the REC mode. Recording will end according to the set trigger timing.
 - 5) Once recording to the appropriate block (B1) has been completed, it switches to the next block (B2) and automatically switches from the REC mode to the ARM mode.
 - 6) Recording in 4)~5) is repeated, and once recording to all of the blocks in the appropriate memory segment (SEGMENT1) has been completed, it switches from the REC mode to the STOP mode.
- * Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.
- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
 - If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed

3.2.14.6.3 MULTI(C)

MULTI(C) indicates the “CONTINUOUS” mode. In the CONTINUOUS mode, multi trigger recording can be repeated while overwriting blocks in the appropriate segment where recording has been completed

Figure 3-39 shows how to switch modes with the J-PAD3 during MULTI(C) recording (top of the figure) and saving in the memory (bottom of the figure).

The sequences for setting two memory segments and four blocks, and for MULTI(A) recording to memory segment 1 are shown below.

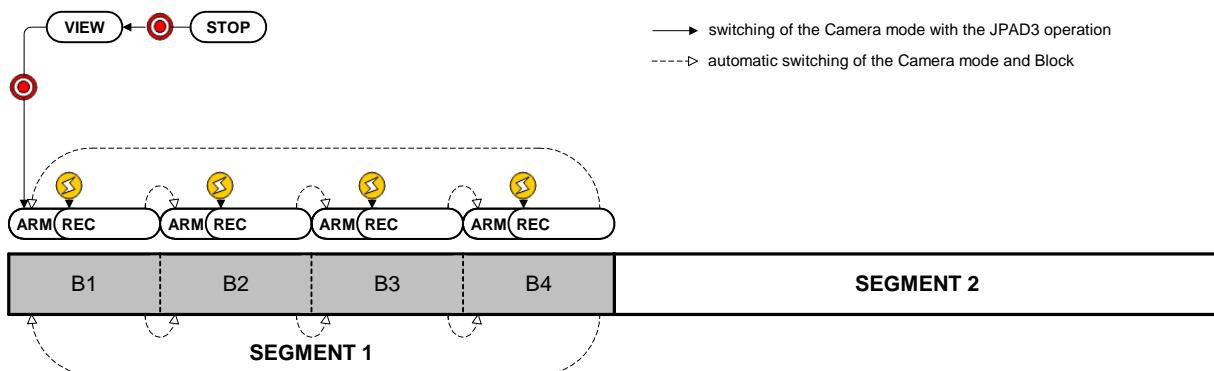













Figure 3-39 Multi Trigger Recording (MULTI(C), Number of Segments: 2, Number of Blocks: 4)

- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.
The frame counter (FRAME) superimposed on the image shows "04 C". There are 4 blocks displaying the CONTINUOUS mode setting. 
- 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode.
The frame counter (Frame) displays "01 C". While the images are overwritten to block 1, it awaits trigger input. 
- 4) While in the ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to the REC mode. Recording will end according to the set trigger timing.
- 5) Once recording to the appropriate block (B1) has been completed, it switches to the next block (B2) and automatically switches from the REC mode to the ARM mode.
- 6) Recording in 4)~5) is repeated, and once recording to all of the blocks in the appropriate memory segment (SEGMENT1) has been completed, it switches to the top block (B1) and automatically switches from the REC mode to the ARM mode.

The recording operation from 6) can be repeated while subsequent images are overwritten. Press STOP  to stop recording.

- * Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.

- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed

3.2.14.6.4 MULTIS(A)

Figure 3-40 shows how to switch modes with the J-PAD3 during MULTIS(A) recording (top of the figure) and saving in the memory (bottom of the figure). MULTIS(A) is multi trigger recording in the AUTO mode.

The sequences for setting two memory segments and four blocks, and for MULTIS(A) recording to all of the memory segments are shown below.

The memory should be empty before recording is started.

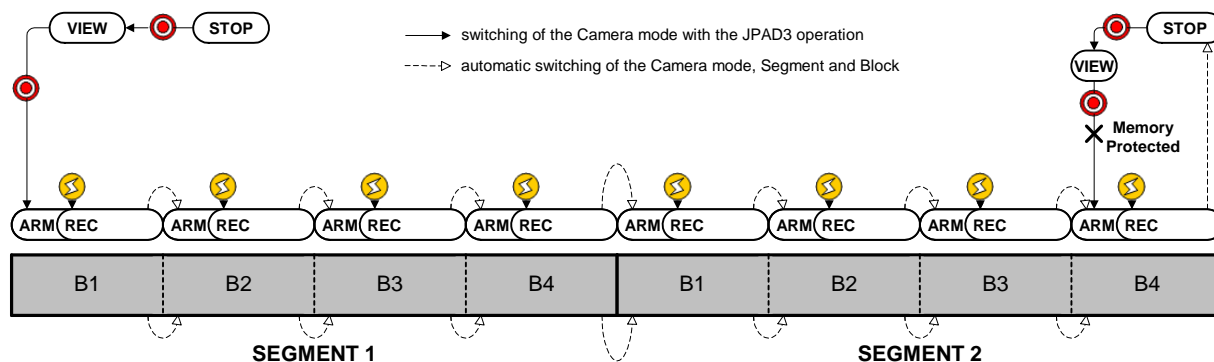


Figure3-40 Multi Trigger Recording (MULTIS(A), Number of Segments: 2, Number of Blocks: 4)

- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.

The memory segment number (SEG) superimposed on the image shows "A". The AUTO mode settings are displayed.




The frame counter (FRAME) superimposed on the image shows "04 A". There are 4 blocks displaying the ALL BLOCKS mode setting.





- 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode.




The frame counter (Frame) displays "01 A". While the images are overwritten to block 1, it awaits trigger input.



- 4) While in the ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to the REC mode. Recording will end according to the set trigger timing.
- 5) Once recording to the appropriate block (B1) has been completed, it switches to the next block (B2) and automatically switches from the REC mode to the ARM mode.
- 6) Repeat recording in 4)~5), and once recording to all of the blocks in the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from the REC mode to the ARM mode.
- 7) If the recording operation from 6) is repeated and recording to all of the memory segments has been completed, it switches from the REC mode to the STOP mode. The memory segment does not automatically switch after the final memory segment (SEGMENT2) recorded.

Memory protection applies to memory segments where the recording has been completed so it does not switch to the ARM mode. If you want to record again, either change the settings to a recording method other than the AUTO mode, or erase the memory segment.

* Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.

- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
 - If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed
- ※

3.2.14.6.5 MULTIS(L)

Figure 3-41 shows how to switch modes with the J-PAD3 during MULTIS(L) recording (top of the figure) and saving in the memory (bottom of the figure). MULTIS(L) is multi trigger recording in the LOOP mode.

The sequences for setting two memory segments and four blocks, and for MULTIS(L) recording to all of the memory segments are shown below.

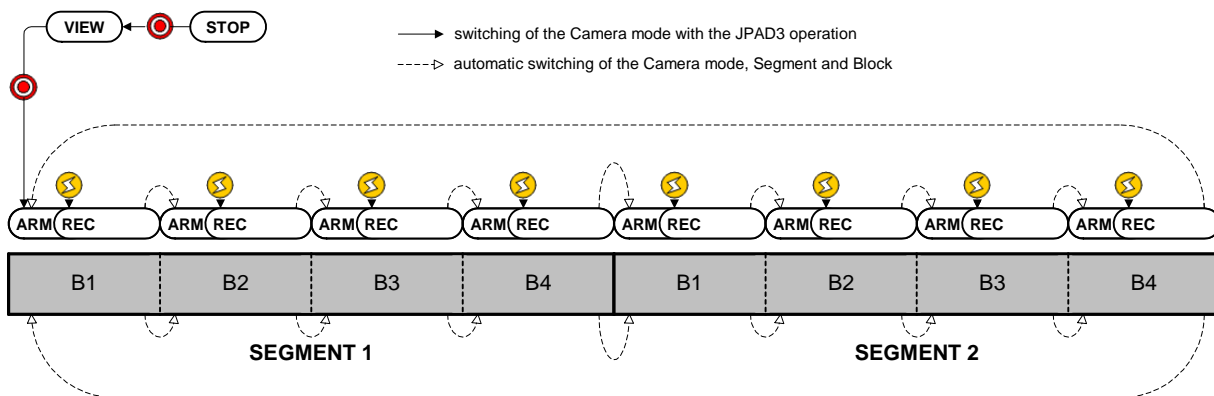


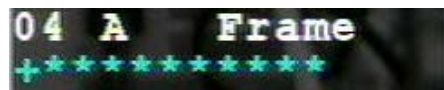
Figure3-41 Multi Trigger Recording (MULTIS(L), Number of Segments: 2, Number of Blocks: 4)


- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.

The memory segment number (SEG) superimposed on the image shows "L". The LOOP mode settings are displayed.




The frame counter (FRAME) superimposed on the image shows "04 A". There are 4 blocks displaying the ALL BLOCKS mode setting.









- 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode.
The frame counter (Frame) displays "01 A". While the images are overwritten to block 1, it awaits trigger input.



- 4) While in the ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to the REC mode. Recording will end according to the set trigger timing.
- 5) Once recording to the appropriate block (B1) has been completed, it switches to the next block (B2) and automatically switches from the REC mode to the ARM mode.

- 6) Repeat recording in 4)~5), and once recording to all of the blocks in the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from the REC mode to the ARM mode.
- 7) If the recording operation from 6) is repeated and recording to all of the memory segments has been completed, it switches to the top block (B1) of the top memory segment (SEGMENT1) and automatically switches from the REC mode to the STOP mode.

The recording operation in 7) can be repeated while overwriting subsequent images. Press STOP  to stop recording.

- * Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.
 - If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
 - If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed

3.2.14.7 Event Recording

With event recording, the first trigger input is treated as a normal recording trigger signal and the second and subsequent trigger inputs are treated as event triggers. An identification mark, called an event frame, is input on the image the instant the event trigger occurs.

The three modes within event recording include EVENT, EVENT(A) and EVENT (L). Refer to **【3.2.14.3 Setting Method】** for the method of setting event recording.

Next are the event recording restrictions and the recording sequence for each mode.

3.2.14.7.1 Event Recording Restrictions

The following restrictions apply to event recording.

- Event recording cannot be combined with burst recording and multi trigger recording. Recording can be combined with EST synchronized signal recording.
- The first trigger input can be input using the J-PAD3 but continuous event trigger input is not possible with the J-PAD3. Input event trigger signals from the J1 cable TRIG1 connector on the rear panel or the J3 cable TRIG2 connector.

3.2.14.7.2 EVENT

Figure 3-42 shows how to switch modes with the J-PAD3 during event recording (top of the figure) and saving in the memory (bottom of the figure).

The sequence for segmenting the memory into four memory segments and performing event recording for memory segment 1 is shown below.

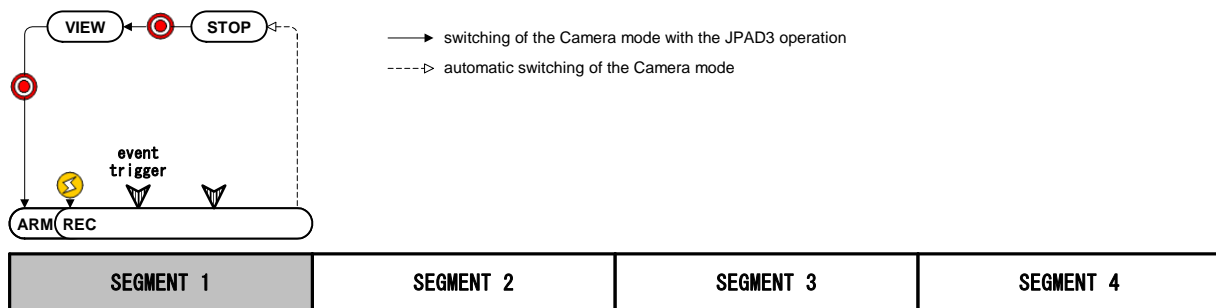











Figure 3-42 Event Recording (EVENT, number of segments : 4)

- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
 - 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode. The frame counter (FRAME) superimposed on the image is displayed as "E". Event recording settings are displayed.
 
 - 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
 - 4) While in the ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to the REC mode. Continue to input event trigger signals from the TRIG1 connector on rear panel or the J3 cable TRIG2 connector to save the event frames. Recording will end according to the set trigger timing.
 - 5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches from the REC mode to the STOP mode.
- * Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.
- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
 - If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed

3.2.14.7.3 EVENT(A)

Figure 3-43 shows how to switch modes with the J-PAD3 during EVENT(A) recording (top of the figure) and saving in the memory (bottom of the figure). EVENT (A) refers to event recording in the AUTO mode.

The sequences for setting four memory segments and for EVENT(A) recording to all of the memory segments are shown below.

The memory should be empty before recording is started.

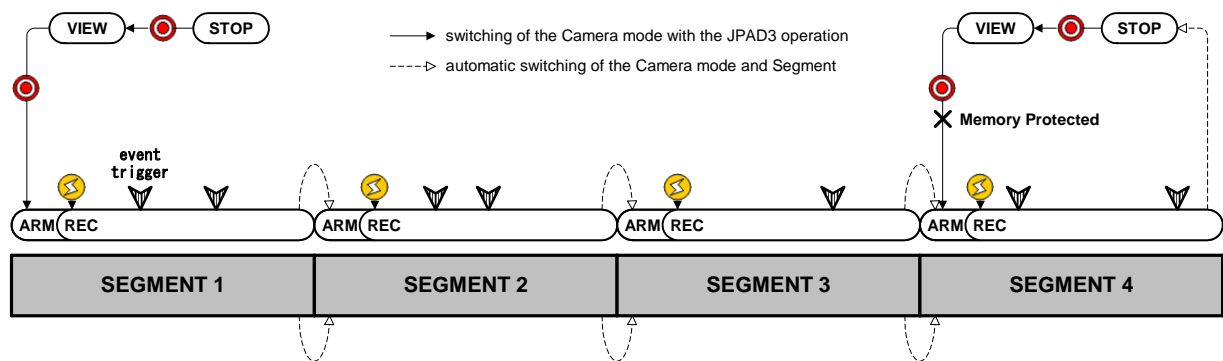





Figure 3-43 Event Recording (EVENT(A), Number of Segments: 4)



- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode. The memory segment number (SEG) superimposed on the image shows "A". The AUTO mode settings are displayed.






The frame counter (Frame) shows "E". The event recording settings are displayed.



- 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
- 4) While in the ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to the REC mode. Continue to input event trigger signals from the TRIG1 connector on rear panel or the J3 cable TRIG2 connector to save the event frames. Recording will end according to the set trigger timing.
- 5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from the REC mode to the ARM mode.
- 6) Repeat recording in 4)~5), and once recording to all of the memory segments has been completed, it switches from the REC mode to the STOP mode. The memory segment does not automatically switch after the final memory segment (SEGMENT4) recorded.
- 7) Memory protection applies to memory segments where the recording has been completed so it does not switch to the ARM mode. If you want to record again, either change the settings to a recording method other than the AUTO mode, or erase the memory segment.

* Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.

- If STOP  is pressed during the ARM mode
If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.
- If STOP  is pressed during the REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.14.7.4 EVENT(L)

Figure 3-44 shows how to switch modes with the J-PAD3 during EVENT(L) recording (top of the figure) and saving in the memory (bottom of the figure). EVENT(L) is event recording in the LOOP mode.

The sequences for setting four memory segments and for EVENT(L) recording to all of the memory segments are shown below.

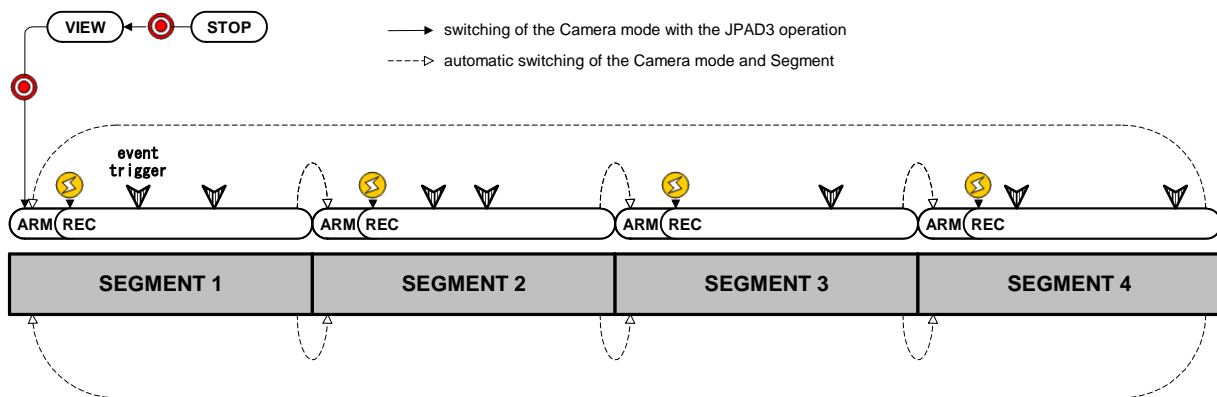











Figure 3-44 Event Recording (EVENT(L), Number of Segments: 4)

- 1) Verify that the MEMRECAM GX-3 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.
The memory segment number (SEG) superimposed on the image shows "L". The LOOP mode settings are displayed.

The frame counter (Frame) shows "E". The event recording settings are displayed.

- 3) While in the VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to the ARM mode.
While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
- 4) While in the ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to the REC mode. Continue to input event trigger signals from the TRIG1 connector on rear panel or the J3 cable TRIG2 connector to save the event frames. Recording will end according to the set trigger timing.
- 5) Once recording to the appropriate memory segment (SEGMENT1) has been completed, it switches to the next memory segment (SEGMENT2) and automatically switches from the REC mode to the ARM mode.

- 6) Repeat recording in 4)~5), and once recording to all of the memory segments has been completed, it switches to the top memory segment (SEGMENT1) and automatically switches from the REC mode to the STOP mode.


The recording operation in 6) can be repeated while subsequent images are overwritten. Press STOP  to stop recording.

- * Press STOP  even when recording to the appropriate memory segment has not been completed to stop recording. Depending on the camera mode when STOP  is pressed, the number of frames saved before recording is stopped will vary.

- If STOP  is pressed during the ARM mode

If the custom setting for the trigger timing is +100%, recording stops when the same number of frames is saved.

- If STOP  is pressed during the REC mode

Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.









3.2.15 Synchronized Timing Selection (SYNC TIME)

While in the STOP mode, the synchronize timing can be selected from the SYS MENU on the J-PAD3.

The MEMRECAM GX-3 can be synchronized with the time on the timer of the device where connected.

- **Camera Synchronized Time**
Synchronized timing with the internal camera timer. Select if the MEMRECAM GX-3 is used alone or if there is no need for precise synchronization. If a control PC is connected, synchronization with the PC time is possible.
- **GX-HUB Synchronized Time**
Synchronized timing with the internal GX-HUB timer. Select if there are multiple camera connections using the GX-HUB. If a control PC is connected, synchronization with the PC time is possible.
- **IRIG Synchronized Time**
Synchronized timing with the IRIG-B time code. Select from the following.
 - If the MEMRECAM GX-3 used alone and the IRIG-B time code is input from the J3 cable IRIG-B connector
 - If multiple cameras are connected using the GX-HUB and the IRIG-B time code is input to the GX-HUB
 - If multiple cameras are connected to the MEMRECAM GX-3 and another camera from the MEMRECAM series, and the GX-HUB is connected to the M-HUB, and the IRIG-B time code is input to the M-HUB

3.2.15.1 Setting Method

- 1) While in the STOP mode, press MENU  to display the TOPTOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU, and then press SET  to display SYS MENU.
- 3) Use the arrows   to select "SYNCTIME" from the SYS MENU (Figure 3-45).
- 4) Use the arrows   to select the synchronized time.

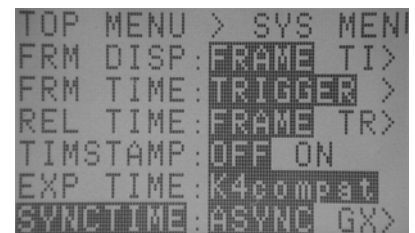



Figure3-45 SYNC SEL

ASYNC	Synchronized with the internal timer of the camera
GX-HUB	Synchronized with the internal timer of the GX-HUB
IRIG	Synchronized with the IRIG-B time code

Refer to the **[GX-HUB User's Manual]** for multiple connections using the GX-HUB.

3.2.15.2 IRIG Synchronized Time

Confirm whether or not the time is synchronized with the IRIG-B time code on the VIEW screen.

- 1) While in the STOP mode, press VIEW/ARM  on the J-PAD3 to switch to the VIEW mode.
- 2) If "I" is displayed in green in the frame counter superimposed over the image, it is synchronized to the standard timing of the IRIG-B time code.
- 3) If "I" is displayed in red, the IRIG-B time code is not input properly.



3.2.16 Synchronized Signal Selection (SYNC SEL)

While in the STOP mode, the synchronized signals can be selected from the SYS MENU on the J-PAD3.

The MEMRECAM GX-3 uses the starting time for sensor exposure as the standard for recording. The exposure time is synchronized with the internal time signals or the external time signals shown below.

- Internal Time Signals (INT)
Synchronized with the synchronized signals (VD signals) in the camera.
- External Time Signals (EST2)
If EST2 is selected, the exposure start signals (EST : External Shutter Trigger, Exposure Start) input from the J3 cable EST2 connector is the standard. The minimum frequency for the EST signal is 0Hz so ultra high speed recording is possible.

3.2.16.1 Setting Method









- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU, and then press SET  to display the SYS MENU.
- 3) Use the arrows   to select "SYNC SEL" from the SYS MENU (Figure 3-43).
- 4) Use the arrows   to select the synchronized signals.



Figure 3-46 SYNC SEL

INT	Synchronized with the internal synchronization signals of the camera
EST2	Synchronized with the EST2 signal from the J3 connector

It is possible to set the polarity of the exposure start signal from the EST2 connector.
Refer to **【3.2.16 External Input/Output Signal Polarity Selection】** .

3.2.16.2 Synchronized EST Signal Recording

3.2.16.2.1 Precautions for Use

- 1) Filter Value Settings
If there is noise in the EST signal, set a noise filter value to activate the filter. Refer to the **【3. 2.18 EST filter setting】** for the setting method.
- 2) Timing Restrictions
The relationship between the cycle for the EST signal and the maximum recording speed must fulfill the following conditions. If they are not met, proper recording is not possible.

$$\text{EST signal cycle} > 1 \text{ } \diagup \text{ maximum recording speed}$$

The relationship between the cycle for the EST and the shutter exposure time must also fulfill the following conditions. If they are not met, proper recording is not possible.

$$\text{EST signal cycle} > \text{shutter exposure time} + 5.84 \mu \text{ sec}$$

3.2.16.2.2 Display During Recording

Operation can be verified during synchronized EST signal recording by the image and the rear panel LED display.

1) VIEW Mode

Verify that "EST2" is displayed in the recording speed superimposed on the image and that synchronized signal setting shows EST2.



While in the VIEW mode, the rear panel CM LED flashes in white.

2) ARM Mode

While in the ARM mode, the rear panel CM LED flashes in magenta.

3) REC Mode

While in the REC mode, the rear panel CM LED flashes in orange.

3.2.17 Sync Signal Setting in VIEW mode (EST VIEW)

In case of the EST mode, the images are not captured unless the external signal is input to the camera basically. EST VIEW allows you to switch the sync signal between the internal clock signal and the external sync signal for the live image display in VIEW. For example, if you set EST VIEW at OFF, it allows you to monitor the live images in VIEW using internal clock signal even if the external signal is not input (not ready) to the camera.

- EST VIEW OFF : Live images are synchronized with the internal clock signal in VIEW.
When you turn to ARM and REC, the sync signal is switched to the external sync signal from the internal clock signal.
- EST VIEW ON : Live images are synchronized with the external sync signal in VIEW.
i.e. The sync signal is always the external sync signal in the VIEW, ARM and REC.









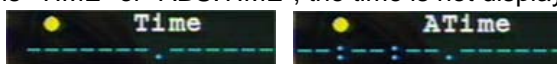
- 1) In the STOP mode, press MENU  to enter the TOP MENU.
- 2) Use the up/down keys   to select "SYS MENU" from the TOP MENU, and then press SET  to enter the SYS MENU.
- 3) Use the up/down keys   to select "EST VIEW" from the SYS MENU (Figure 3-47).
- 4) Use the left/right keys   to select the synchronized signal setting at VIEW mode.



Figure 3-47 EST VIEW

OFF	Internal clock sync in VIEW.
ON	EST sync in VIEW.

Attention) If the EST mode is used under the condition that the Time Stamp is "OFF" and the Frame Counter Display is "TIME" or "ABS.TIME", the time is not displayed as follows.



3.2.18 External Input/Output Signal Polarity Selection and Filter setting(SIG SET)

While in the STOP mode, the polarity of the external input/output signal can be selected from the SYS MENU on the J-PAD3.

3.2.18.1 External Input/Output Signal Polarity Selection

With the external input/output signals shown below, the polarity can be set to either a rising or a falling edge.

- External Trigger Input (TRIG1,TRIG2)
- External Synchronized Signal Input (EST2)
- Exposure Pulse Output (EPO)










- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "SIG SET" from the SYS MENU and press SET  to display the SIG SET sub-menu (Figure3-48).
- 4) Select the external input/output signal to be set and use the arrows   to select the polarity.



Figure 3-48 SIG SET

TRIG1	POSI	Search for the external trigger signal from the TRIG1 connector on rear panel by the rising edge
	NEGA	Search for the external trigger signal from the TRIG 1 connector on rear panel by the falling edge
TRIG2	CRNTON	Search for the external trigger signal from the J3 cable by the rising edge
	CRNTOFF	Search for the external trigger signal from the J3 cable by the falling edge
EST2	POSI	Search for the EST signal from the J3 cable by the rising edge
	NEGA	Search for the EST signal from the J3 cable by the falling edge
EPO	POSI	Output the H level signal during exposure
	NEGA	Output the L level signal during exposure

3.2.18.2 TRIGGER Filter Setting (TRIGFLT)














MEMRECAM GX-3 equips digital noise fileter. If there is noisy electrical environment, you can filter noise by increasing the filter value.

Filter value shows a delay time in case of trigger signal input by clean square waveform without chattering. You can set the value from 0.0 to 6553.5 μ sec in 0.1 μ sec increment.

Filter value shall be applied to both external trigger inputs (TRIG1 & TRIG2).

However, in case of TRIG1(Rear panel) in polarity setting of NEGA, 1.4 μ sec is always added to a delay time. Also, in case of TRIG1(Rear panel) in polarity setting of POSI , 30 μ sec is added to a delay time.

In case of TRIG2(though J3) in polarity setting of CRNON, 5 μ sec is always added to a delay time. Also, in case of TRIG2(though J3) in polarity setting of CRNTOFF, 150 μ sec is added to a delay time.

- 1) Press MENU key  in STOP mode to enter TOP MENU.
- 2) Press up/down keys   to go SYS MENU. Then press SET key  to enter SYS MENU.
- 3) Press up/down keys   to go SIG SET. Then press SET key  to enter sub menu of SIG SET.
- 4) Select TRIGFLT and push SET Key  (Fig 3-49).
- 5) Press left/right keys   to move a figure, press up/down keys   to chage a value (range: 0.0~6553.5 μ sec).
- 6) Press SET key  to set the filter value.

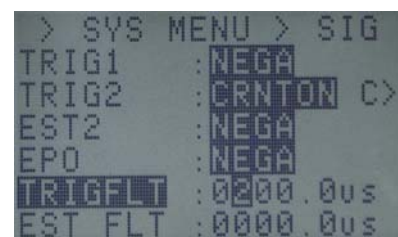


Figure3-49 TRIGFLT

3.2.18.3 EST Filter setting (EST FLT)

MEMRECAM GX-3 equips digital noise filter. If there is noisy electrical environment, you can filter noise by increasing the filter value.

Filter value shows a delay time in case of trigger signal input by clean square waveform without chattering. You can set the value from 0.0 to 6553.5 μ sec in 0.1 μ sec increment.

This filter value is applied to an EST input (EST2).

However, in case of EST2(though J3) in polarity setting of NEGA, 1.4 μ sec is always added to a delay time. Also, in case of polarity setting of POSI, 30 μ sec is added to a delay time.










- 1) Press MENU key  in STOP mode to enter TOP MENU.
- 2) Press up/down keys  to go SYS MENU. Then press SET key  to enter SYS MENU.
- 3) Press up/down keys  to go SIG SET. Then press SET key  to enter sub menu of SIG SET.
- 4) Select EST FLT and press SET Key  (Fig 3-50).
- 5) Press left/right keys  to move a figure, press up/down keys  to change a value (range: 0.0~6553.5 μ sec).
- 6) Press SET key  to set the filter value.











Figure3-50 EST FLT

3.2.19 Time Stamp Recording Setting (TIMESTAMP)

You can set the Time Stamp Recording by SYS MENU of J-Pad 3 in STOP mode.

Time Stamp Recording enables to record the following information on each frame during recording.

- Exposure time (D/H/M/S in mmin, in usec)
- Trigger Time (D/H/M/S in mmin in usec)
- Event
- IRIG Lock

- 1) Press MENU key  in STOP mode to enter TOP MENU.
- 2) Press up/down keys   to go SYS MENU. Then press SET key  to enter SYS MENU.
- 3) Press up/down keys   to go TIMESTAMP (Fig 3-51).
- 4) Press left/right keys   to turn on/off Time Stamp Recording.

OFF	Disable Time Stamp Recording
ON	Enable Time Stamp Recording



Figure 3-51 TIMESTAMP

3.2.20 Exposure Timing Selection (EXP TIME)

While in the STOP mode, the sensor exposure timing for synchronized signal recording can be selected from the SYS MENU on the J-PAD3.

The sensor exposure timing for synchronized signal recording is different depending on the MEMRECAM GX-3 or other MEMRECAM series cameras (fx,ci cameras). When conducting synchronized recording with the MEMRECAM GX-3 and other MEMRECAM series cameras, the exposure timing for all of the cameras must be coordinated.









- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "EXP TIME" from the SYS MENU. (Figure3-52)
- 4) Use the arrows   to select the exposure time.



Figure3-52 EXP TIME

GXnative	Start exposure with rising synchronized signal recording (Setting only when recording in GX-3)
K3compat	End exposure with rising synchronized signal recording (Setting only with synchronized recording with fx series cameras other than fx-K4 and K5)
K4compat	End exposure with rising synchronized signal recording (Setting for synchronized recording with fx-K4 and K5)

CAUTION) Refer to a **【GXLink User's Manual】** for the synchronized recording by the multi-camera connection between MEMRECAM GX-3 and other MEMRECAM series cameras.






3.3 Live Image / Playback Image Settings

The image quality of the live images displayed during photographing and the playback images displayed after photographing can be adjusted. It is also possible to zoom the images and have scroll display.

3.3.1 Gain (GAIN)

Sets the image sensitivity.

3.3.1.1 Gain Settings for Live Images






- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Use the arrows   to select "GAIN" from the VIEW MENU. (Figure 3-53)
- 3) Use the arrows   to select the gain.

LOW	One level lower than NORMAL sensitivity
NORMAL	Standard sensitivity setting
HIGH	One level higher than NORMAL sensitivity



Figure 3-53 GAIN(VIEW MENU)

3.3.1.2 Gain Settings for Playback Images

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "GAIN" from the TOP MENU. (Figure 3-54)
- 3) Use the arrows   to select the gain.

LOW	One level lower than NORMAL sensitivity
NORMAL	Standard sensitivity setting
HIGH	One level higher than NORMAL sensitivity








Figure 3-54 GAIN(TOP MENU)

3.3.2 Enhance (ENHANCE)

Sets the profile enhancement for the image.

3.3.2.1 Enhance Settings for Live Images

- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Use the arrows   to select "ENHANCE" from the VIEW MENU. (Figure3-55)
- 3) Use the arrows   to select the enhance.

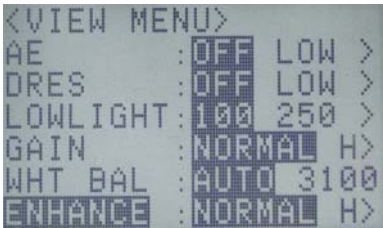







Figure 3-55 ENHANCE(VIEW MENU)

OFF	No profile enhancement
LOW	Low profile enhancement
NORMAL	Normal profile enhancement
HIGH	High profile enhancement

3.3.2.2 Enhance Settings for Playback Images

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "ENHANCE" from the TOP MENU. (Figure3-56)
- 3) Use the arrows   to select the enhance.

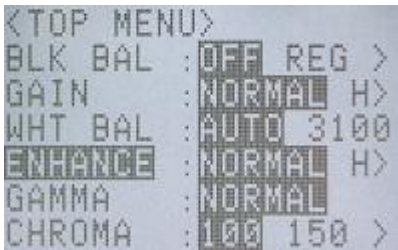







Figure 3-56 ENHANCE(TOP MENU)

OFF	No profile enhancement
LOW	Low profile enhancement
NORMAL	Normal profile enhancement
HIGH	High profile enhancement

3.3.3 Gamma (GAMMA)

Sets the gamma properties for the image.

3.3.3.1 Gamma Settings for Live Images






- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Use the arrows   to select "GAMMA" from the VIEW MENU. (Figure3-57)
- 3) Use the arrows   to select the gamma.

OFF	No gamma correction
LOW	Low gamma correction
NORMAL	Normal gamma correction



Figure 3-57 GAMMA(VIEW MENU)

3.3.3.2 Gamma Settings for Playback Images

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "GAMMA" from the TOP MENU. (Figure3-58)。
- 3) Use the arrows   to select the gamma.

OFF	No gamma correction
LOW	Low gamma correction
NORMAL	Normal gamma correction








Figure 3-58 GAMMA(TOP MENU)

3.3.4 Chroma (CHROMA)

Sets the chroma (color density) of the image.

3.3.4.1 Chroma Settings for Live Images

- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Use the arrows   to select "CHROMA" from the VIEW MENU. (Figure 3-59)
- 3) Use the arrows   to select the chroma.

0	Chroma	0% (Black and white image)
50	Chroma	50%
100	Chroma	100% (normal)
150	Chroma	150%
200	Chroma	200%

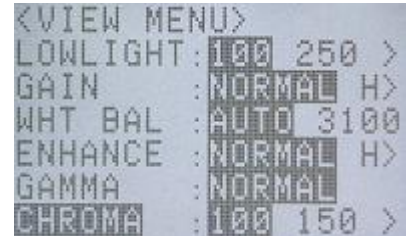







Figure 3-59 CHROMA(VIEW MENU)

3.3.4.2 Chroma Settings for Playback Images

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "CHROMA" from the TOP MENU. (Figure 3-60)
- 3) Use the arrows   to select the chroma.

0	Chroma	0% (Black and white image)
50	Chroma	50%
100	Chroma	100% (normal)
150	Chroma	150%
200	Chroma	200%

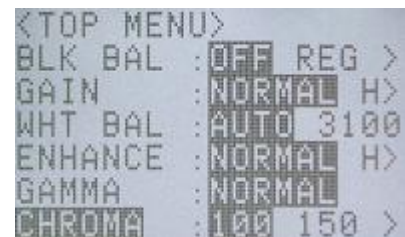







Figure 3-60 CHROMA(TOP MENU)

3.3.5 Knee (KNEE)

Reduces the gain and corrects the dynamic range for signals where the brightness exceeds a prescribed level.

3.3.5.1 Knee Settings for Live Images

- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Use the arrows   to select "KNEE" from the VIEW MENU. (Figure 3-61)
- 3) Use the arrows   to select the knee.

OFF Knee Correction OFF
ON Knee Correction ON

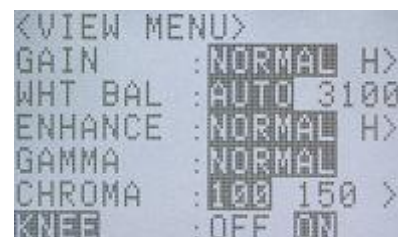







Figure 3-61 KNEE(VIEW MENU)

3.3.5.2 Knee Settings for Playback Images

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "KNEE" from the TOP MENU. (Figure 3-62)
- 3) Use the arrows   to select the knee.

OFF Knee Correction OFF
ON Knee Correction ON

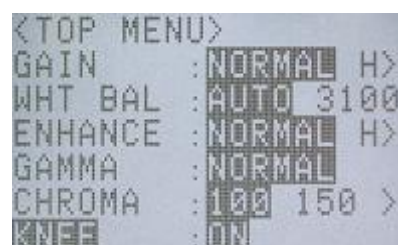





Figure 3-62 KNEE(TOP MENU)

3.3.6 RGB Matrix (RGB COR.)

You can change the RGB matrix to improve color reproduction.

3.3.6.1 RGB matrix setting in live image




- 1) In VIEW mode, press MENU key  to enter VIEW MENU.
- 2) Press up/down keys  to select RGB COR. (Fig.3-63)
- 3) Press left/right keys  to turn on/off the RGB matrix.

OFF	Disable RGB matrix.
ON	Enable RGBmatrix.



Figure 3-63 RGB COR.(VIEW MENU)

3.3.6.2 RGB matrix setting in playback image

- 1) In STOP mode, press MENU key  to enter TOP MENU.
- 2) Press up/down keys  to select RGB COR. (Fig.3-64)
- 3) Press left/right keys  to turn on/off the RGB matrix.

OFF	Disable RGB matrix.
ON	Enable RGBmatrix.








Figure 3-64 RGB COR.(TOP MENU)

3.3.7 Luminance (LUMINANC)

You can set input/output characteristics of image data (luminance). In case of LINEAR, it makes a full-scale value of input image data become a 8bit (0-255) output data in linier.

3.3.7.1 Luminance setting in live image

- 1) In VIEW mode, press MENU key  to enter VIEW MENU.
- 2) Press up/down keys   to select LUMINANC. (Fig.3-65)
- 3) Press left/right keys   to select the luminance mode.

NORMAL	Enable gain, gamma and knee
LINEAR	Display image in linear gamma (disable gain, gamma and knee)
CUSTOM	Custom settings of the brightness characteristics (When CUSTOM is selected, "custom brightness characteristic" dialogue is displayed.) (*1)

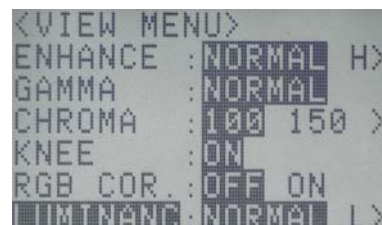







Figure 3-65 LUMINANC(VIEW MENU)

- *1** It is not possible to set CUSTOM, although it can be selected by J-PAD3. Use the GXLink to set the custom value. Refer to **【GXLink User's Manual】** for the setting.

3.3.7.2 Luminance setting in palyback image

- 1) In STP mode, press MENU key  to enter TOP MENU.
- 2) Press up/down keys   to select LUMINANC. (Fig.3-66)
- 3) Press left/right keys   to select the luminance mode.

NORMAL	Enable gain, gamma and knee
INEAR	Display image in linear gamma (disable gain, gamma and knee)
CUSTOM	Custom settings of the brightness characteristics (When CUSTOM is selected, "custom brightness characteristic" dialogue is displayed.) (*1)

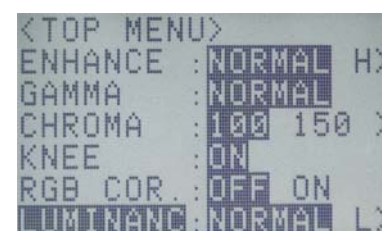


Figure 3-66 LUMINANC(TOP MENU)

- *1** It is not possible to set CUSTOM, although it can be selected by J-PAD3. Use the GXLink to set the custom value. Refer to **【GXLink User's Manual】** for the setting.

3.3.8 Black Balance (BLK BAL)

Function that corrects the black level sensor and erases noise elements.

The MEMRECAM GX-1 reads the sensor temperature and automatically implements the black balance. However, if a finer image is desired, the black balance should be selected just prior to photographing.

The sensor black level and the noise elements will vary according to the recording speed and frame size settings. Also, if the recording speed and frame size are changed when the black balance is ON (REG), a black balance warning will be displayed.

Black balance can only be calculated while in the STOP mode.






- 1) Put the lens cap on the camera so the sensor receives no light.
- 2) While in the STOP mode, press MENU  to display the TOP MENU.
- 3) Use the arrows   to select "BLK BAL" from the TOP MENU. (Figure3-67)
- 4) Use the arrows   to select the black balance.



Figure 3-67 BLK BAL(TOP MENU)

OFF	No black balance correction
REG	Black balance reflects the corrected data
SET	Calculates black balance correction

- i) Start calculating black balance correction start by selecting "SET".
- ii) It automatically switches to "REG" after black balance correction calculations have been completed.

Caution) Make sure the lens cap covers the sensor when calculating the black balance correction. Proper correction calculations will not be possible if light gets in to the sensor, and the black level of the resulting image will not be uniform.

3.3.9 White Balance (WHT BAL)

Function that corrects the whiteness when photographing with a light source that has varying levels of color temperature.

- Auto White Balance (Auto Tracking)
Automatically determines the color temperature from the image signals and implements the proper white balance. Automatically tracks in a color temperature range from 3000K to 9000K.
- Preset White Balance
Use when the color temperature of the light source is known. The three color temperatures of 3100K, 5000K and 9000K can be set.
- SET/REG White Balance
Use when precisely setting the white balance or when there is a possibility of changing the color temperature during recording. Photograph a piece of white paper before recording to use this mode.

3.3.9.1 White Balance Settings for Live Images






- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Use the arrows   to select "WHT BAL" from the VIEW MENU. (Figure3-68)
- 3) Use the arrows   to select the white balance.








Figure 3-68 WHT BAL(VIEW MENU)

AUTO	Auto white balance
3100K	When the color temperature of the light source is 3100K
5000K	When the color temperature of the light source is 5000K
9000K	When the color temperature of the light source is 9000K
REG	Use for obtaining data from SET
SET	Calculates current white balance data

- i) First select "SET" to access the SET/REG white balance mode.
It automatically switches to the auto white balance mode.
- ii) After the white balance calculations have been completed, the white balance data at that point is saved and then it automatically switches to "REG". This data is used if "REG" is selected in any other mode.

3.3.9.2 White Balance Settings for Playback Images

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "WHT BAL" from the TOP MENU. (Figure 3-69)
- 3) Use the arrows   to select the white balance.

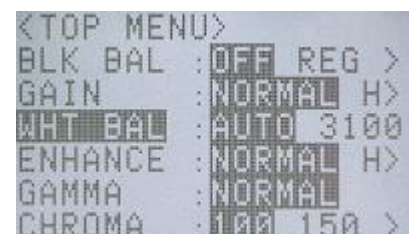


Figure 3-69 WHT BAL(TOP MENU)

AUTO	Auto white balance
3100K	When the color temperature of the light source is 3100K
5000K	When the color temperature of the light source is 5000K
9000K	When the color temperature of the light source is 9000K
REG	Use for obtaining data from SET

3.3.10 Zoom Image (ZOOM)






Displays an enlarged or reduced image.

The display area of the image varies by video output method.

- Display Area for the NTSC Method
Display the image in an area of 640X480 pixels.
- Display Area for the PAL Method
Display the image in an area of 768X576 pixels.

If displaying the image on the entire screen, the set frame size will be displayed either enlarged or reduced within the display area. If displaying the image at a fixed rate, the sections outside the display area will be removed and not displayed on the screen.

3.3.10.1 Zooming Live Images

- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Use the arrows   to select "ZOOM" from the VIEW MENU. (Figure 3-70)
- 3) Use the arrows   to select the zoom.

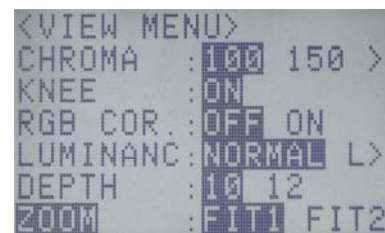


Figure 3-70 ZOOM(VIEW MENU)

- | | |
|-------------|---|
| FIT1 | Display the entire screen in the display area
(the entire image can be displayed on an
overscan compatible video monitor) |
| FIT2 | Display the entire screen reduced to about 80% of the display area
(the entire image can be displayed on
standard video monitors) |
| 1/2 | Image displayed reduced to 1/2 size |
| X1 | Image displayed without enlarging or reducing |
| X2 | Image displayed enlarged to double size |
| X4 | Image displayed enlarged to quadruple size |

3.3.10.2 Zooming Playback Images








- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU.
- 3) Use the arrows   to select "ZOOM" from the SYS MENU. (Figure 3-71)
- 4) Use the arrows   to select the zoom.



Figure 3-71 ZOOM(SYS MENU)

- | | |
|-------------|---|
| FIT1 | Display the entire screen in the display area
(the entire image can be displayed on an
overscan compatible video monitor) |
| FIT2 | Display the entire screen reduced to about 80% of the display area
(the entire image can be displayed on
standard video monitors) |
| 1/2 | Image displayed reduced to 1/2 size |
| X1 | Image displayed without enlarging or reducing |
| X2 | Image displayed enlarged to double size |
| X4 | Image displayed enlarged to quadruple size |

3.3.11 Scroll Image (SCROLL)

Moves the enlarged image for display.

When an enlarged image is displayed in the display area, the center coordinates of the image are moved and the image not displayed can be shown. With the center coordinates at (0, 0), the photographed image can be moved in single pixel units.

For example, if the zoom setting is "x4" and it is moved +1 in the direction of the X axis, the image shifts 4 pixels to the left on the video monitor. Also, if it is moved +1 in the direction of the Y axis, the image shifts down 4 pixels on the video monitor.

3.3.11.1 Scrolling Live Images























- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Use the arrows   to select "SCROLL" from the VIEW MENU and press SET . (Figure 3-72)
- 3) Use the arrows   to shift the display position in the direction of the X axis.
- 4) Use the arrows   to shift the display position in the direction of the Y axis.
- 5) Use TRIG  to return to the center coordinates (0 0).
- 6) Press SET  again to set the display position.



Figure 3-72 SCROOL(VIEW MENU)

3.3.11.2 Scrolling Playback Images

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU.
- 3) Use the arrows   to select "SCROLL" from the SYS MENU and press SET . (Figure 3-73)
- 4) Use the arrows   to shift the display position in the direction of the X axis.
- 5) Use the arrows   to shift the display position in the direction of the Y axis.
- 6) Use TRIG  to return to the center coordinates (0 0).
- 7) Press SET  again to set the display position.

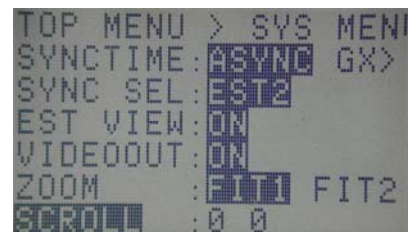


Figure 3-73 SCROOL(SYS MENU)

3.3.12 Low Light Mode Settings (LOWLIGHT)

While in the VIEW mode, set the low light mode from the VIEW MENU on the JPAD3.

There are times with low light conditions during the preparatory stages of photography when it is not possible to get a crisp live image in the VIEW mode. If the low light mode is used in these instances, the image is displayed brighter than images photographed with the set recording speed, making it possible to easily verify the angle of view and the focus.

The low light mode only applies to image display in the VIEW mode and does not impact the image displayed in the ARM, REC mode or during actual recording. Actual recording is conducted according to the set recording speed.














- 1) While in the VIEW mode, press LOWLIGHT  to switch to the low light mode.
- 2) If changing the low light settings, press MENU  to display the VIEW MENU.
- 3) Use the arrows   to select "LOWLIGHT" from the VIEW MENU. (Figure 3-74)
- 4) Use the arrows   to select the low light mode.



Figure 3-74 LOWLIGHT (VIEW MENU)

100	Displays live image at a photographic speed of 100pps
250	Displays live image at a photographic speed of 250pps
500	Displays live image at a photographic speed of 500pps
1000	Displays live image at a photographic speed of 1000pps
*****p	Low Light Mode Custom Settings

- i) If using custom settings for the low light mode, select "*****p" and press SET .
 - ii) Use arrows   to move columns and use arrows   to change the numerical value. (range: 100~1000pps)
 - iii) Press SET  again to set the recording speed for the low light mode.
- 5) Press LOWLIGHT  again to return to the normal live image display.
If the lens was adjusted while in the low light mode, be sure to adjust it again.

※ Segment Frame Display







While in the low light mode, the image will be displayed in 1280x960 pixels (zoom setting : 1/2), regardless of the frame size set. The actual frame size will display only the profile of the segment frame.

If the actual frame size recorded is small, the angle of the view can be adjusted while viewing the image.

3.3.13 Playback Memory Segment Selection (MEM SEG)

While in the STOP mode, the memory segment to be played can be selected from the TOP MENU on the JPAD3.

If there are several memory segments recorded, select the desired memory segment for playback.

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use arrows   to select "MEM SEG" from the TOP MENU and press SET  to display the sub-menu for MEM SEG. (Figure 3-75). The segment number, recording scene number and trigger time will be displayed.
- 3) Use arrows   to select the desired memory segment and display the recorded image.

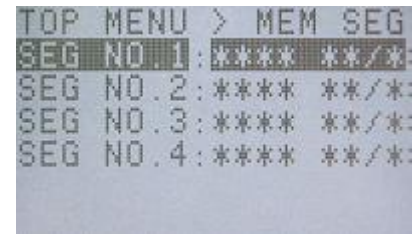


Figure 3-75 MEM SEG

(Figure 3-75 shows 4 memory segments that haven't been recorded yet)

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4


Save Settings

4.1 Items That Can Be Set

The following items related to saving can be set from the menu using the JPAD3 remote control.

- **SAVE MENU**

4.1.1 SAVE MENU Settings

While in the STOP mode, press MENU  to switch from the status screen to the TOP MENU.







Use the arrows   to select SAVE MENU from the TOP MENU and then press SET  to display the SAVE MENU (Figure 4-1). The following items can be set in the SAVE MENU. (Table 4-1)



Figure 4-1 SAVE MENU

Table 4-1 SAVE MENU Settings

Settings	Setting Details
MCFF	Saves the video file
FREE FRM	Displays the number of frames available for recording (display only))
SAVE FRM	Save frame range setting
REC FRM	Displays the recording frame range (display only)
YC TIFF	Save still image file
SAVE SET	Save method settings

After setting in the SAVE MENU, press STOP  or MENU  to return to the status screen (STOP mode). Also, select "TOP MENU > SAVE ME" at the top of the SAVE MENU and press SET  to return to the TOP MENU.

4.2 Save Settings

Save settings in Table 4-1 are described as follows.

4.2.1 Save Frame Range Settings (SAVE FRM)

While in the STOP mode, the save frame range settings can be accessed from the JPAD3 SAVE MENU.












- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SAVE MENU" from the TOP MENU and press SET  to display the SAVE MENU.
- 3) Use the arrows   to select "SAVE FRM" from the SAVE MENU and press SET  (Figure 4-2).
- 4) Use the arrows   to move columns and use the arrows   to change the numerical value.
The start save frame code • number is before the “—” and the end save frame code • number is after the “—” .
- 5) Press SET again to set the save frame range.



Figure 4-2 SAVE FRM

Set the save frame range so it does not exceed the frame number displayed on the SAVE MENU.












- FREE FRM
Depending on the capacity of the external storage media memory connected to the J2 cable USB connector, the number of frames that can be saved is displayed.
- REC FRM
The range for the number of frames recorded is displayed.

4.2.2 Save Method Settings (SAVE SET)

While in the STOP mode, the save method settings can be accessed from the JPAD3 SAVE MENU.

When saving a recorded image as a video file in an external storage media, the following functions can be set to improve the reliability of the data saved.

- **Compare and Rewrite Data (RETRY)**
Compares camera data with data written to the storage media and if a discrepancy is verified, the camera data is rewritten.
- **Initialize Media (ERASE)**
Function to write the black image data in advance and initialize the storage media when saving recorded images.
If there are problems writing data to the storage media, the storage media data will become black image data.
- **Error Detection Response (ERROR)**
If there is an error detected or discrepancy found when comparing the data, set to either stop saving or to continue.

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SAVE MENU" from the TOP MENU and press SET  to display the SAVE MENU.
- 3) Use the arrows   to select "SAVE SET" from the SAVE MENU and press SET  to display the SAVE SET sub-menu (Figure 4-2).
- 4) Use the arrows   to set the save method functions and select the conditions with the arrows  .

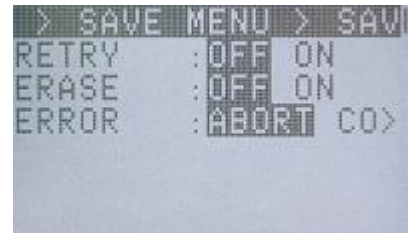









Figure 4-3 SAVE SET

RETRY	OFF	Do not compare data
	ON	Compare data and rewrite
ERASE	OFF	Do not initialize media
	ON	Initialize media
ERROR	ABORT	Display a warning and stop saving when there is a discrepancy between the camera data and the storage media data when an error is detected or the RETRY setting is ON.
	CONTINUE	Display a warning but continue saving even when there is a discrepancy between the camera data and the storage media data when an error is detected or the RETRY setting is ON.

4.2.3 Saving Video Files (MCFF)

While in the STOP mode, the image recorded from the JPAD3 SAVE MENU can be saved as a video file (MCFF).

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SAVE MENU" from the TOP MENU and press SET  to display the SAVE MENU.
- 3) Use the arrows   to select "MCFF" from the SAVE MENU and press SET  to display the transfer mode screen (Figure 4-4).
- 4) Subsequent steps are identical to those found in **【2.9 Saving】**.

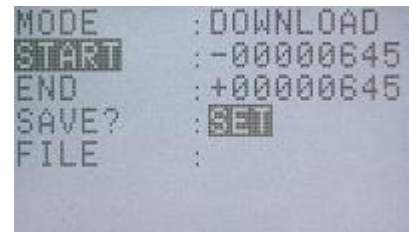









Figure 4-4 Transfer Mode Screen

4.2.4 Saving Still Image Files (YC TIFF)

While in the STOP mode, the image recorded from the JPAD3 SAVE MENU can be saved as a still image file (YC TIFF).

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SAVE MENU" from the TOP MENU and press SET  to display the SAVE MENU.
- 3) Use the arrows   to select "YC TIFF" from the SAVE MENU (Figure 4-5).
- 4) Press SET  to save the frame displayed at that point as a still image file.

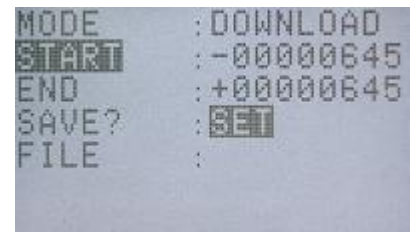


Figure 4-4 Transfer Mode Screen

If saving, a file name of "MCYC0000.TIF" will automatically be assigned (Figure 4-6). If the saving is continued, the file name will be "MCYC0001.TIF", and the numeral will show + 1.

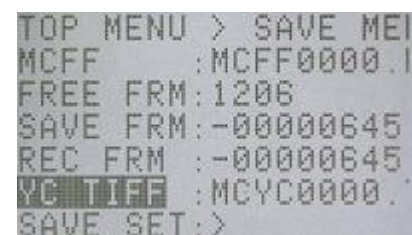


Figure 4-6 Saving YC TIFF

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5


System Settings

5.1 Items That Can Be Set

The following items related to the system can be set from the following menus using the JPAD3 remote control.

- TOP MENU
- SYS MENU
- SYSYSTEM SETUP MENU

5.1.1 TOP MENU Settings

While in the STOP mode, press MENU  to switch from the status screen to the TOP MENU (Figure 5-1). The following items can be set in the TOP MENU (Table 5-1).

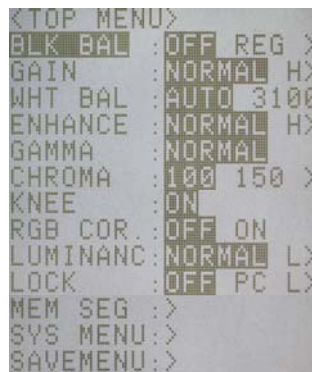





Figure 5-1 TOP MENU




Table 5-1 TOP MENU Settings

Settings	Setting Details	
BLK BAL	Black balance	Refer to Chapter 3 "Recording and Playback Settings"
GAIN	Gain adjustment of playback image	Refer to Chapter 3 "Recording and Playback Settings"
WHT BAL	White balance of playback image	Refer to Chapter 3 "Recording and Playback Settings"
ENHANCE	Enhance correction of playback image	Refer to Chapter 3 "Recording and Playback Settings"
GAMMA	Gamma correction of playback image	Refer to Chapter 3 "Recording and Playback Settings"
CHROMA	Chroma adjustment of playback image	Refer to Chapter 3 "Recording and Playback Settings"
KNEE	Knee adjustment of playback image	Refer to Chapter 3 "Recording and Playback Settings"
RGB COR.	RGB matrix adjustment of playback image	Refer to Chapter 3 "Recording and Playback Settings"
LUMINANC	Brightness characteristics setting of playback image	Refer to Chapter 3 "Recording and Playback Settings"
LOCK	PC operation lock setting	
MEM SEG	Select the playback memory segment number	Refer to Chapter 3 "Recording and Playback Settings"
SYS MENU	Jump to the SYS MENU	
SAVE MENU	Jump to the SAVE MENU	Refer to Chapter 4 "Save Settings"

After setting in the TOP MENU, press STOP  or MENU  to return to the status screen (STOP mode).

5.1.2 SYS MENU Settings

While in the STOP mode, press MENU  to switch from the status screen to the TOP MENU.




Using the arrows,   select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU (Figure 5-2). The following items can be set in the SYS MENU (Table 5-2).

```
TOP MENU > SYS MEN
ID :000
DATETIME:09 09 11
OSD DISP:ALL
OSD MODE:ALWAYS S>
OSD TIME:TRIG CRNT
CAFM DIS:OFF WHT >
FRM DISP:FRAME TI>
FRM TIME:TRIGGER >
REL TIME:FRAME TR>
TIMESTAMP:OFF ON
EXP TIME:K4compat
SYNCTIME:IRIG
SYNC SEL:EST2
EST VIEW:ON
VIDEOOUT:ON
ZOOM :FIT1 FIT2
SCROLL :0 0
BEEP :ON OFF
AUTOVIEW:OFF AUTO>
WARNING :>
TRIG SET:>
SIG SET :>
SYS SET :>
INFO :>
```




Figure 5-2 SYS MENU

Table 5-2 SYS MENU Settings

Settings	Setting Details	
ID	ID number setting	
DATETIME	Date and time setting	
OSD DISP	Display/do not display superimposed information	
OSD MODE	Display/hide the superimposed information by the camera mode	
OSD TIME	Trigger clock setting	
CAFM DIS	Display/do not display mark for center of image	
FRM DISP	Frame counter display setting	
FRM TIME	Frame time standard setting	
REL TIME	Frame relative time display setting	
TIMESTAMP	Time stamp recording setting	Refer to Chapter 3 "Recording and Playback Settings"
EXP TIME	Exposure timing setting	Refer to Chapter 3 "Recording and Playback Settings"
SYNC TIME	Synchronized time setting	Refer to Chapter 3 "Recording and Playback Settings"
SYNC SEL	Synchronized signal setting	Refer to Chapter 3 "Recording and Playback Settings"
EST VIEW	The synchronized signal setting at the time of EST VIEW	Refer to Chapter 3 "Recording and Playback Settings"
VIDEOOUT	Display/do not display image	
ZOOM	Zoom playback image	Refer to Chapter 3 "Recording and Playback Settings"
SCROLL	Scroll playback image	Refer to Chapter 3 "Recording and Playback Settings"
BEEP	Remote control operation sound ON/OFF	
AUTOVIEW	Automatic switch to VIEW mode	
WARNING	Display/do not display warnings	
SIG SET	External input/output signal polarity setting	Refer to Chapter 3 "Recording and Playback Settings"
SYS SET	Segment memory setting, reboot	Refer to Chapter 3 "Recording and Playback Settings"
INFO	System information display (cannot be set)	

After setting in the SYS MENU, press STOP  or MENU  to return to the status screen (STOP mode). Also, select "TOP MENU > SYS MEN" at the top of the SYS MENU and press SET  to return to the TOP MENU.

5.1.3 SYSTEM SETUP MENU Settings

While in the STOP mode, press STOP , SET  and TRIG  simultaneously to switch from the status screen to the SYSTEM SETUP MENU (Figure 5-3). The following items can be set in the SYSTEM SETUP MENU (Table 5-3).

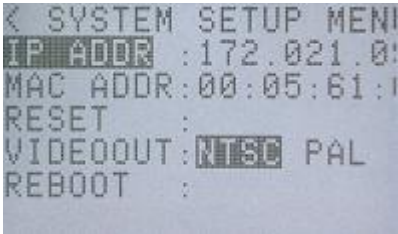




Figure 5-3 SYSTEM SETUP MENU

Table 5-3 SYSTEM SETUP MENU Settings

Settings	Setting Details	
IP ADDR	IP address, sub net mask settings	
MAC ADDR	MAC address display (cannot be set)	
RESET	Reset settings	
VIDEO	Video output method settings	
REBOOT	Reboot network	

After setting in the SYSTEM SETUP MENU, press STOP  or MENU  to return to the status screen (STOP mode).

5.2 System Settings

Settings related to the system in Table 5-1, Table 5-2 and Table 5-3 are described below.

5.2.1 Allowed/Prohibited Settings for Operations on the Control PC (LOCK)

While the control PC is connected to the J3 cable ETHER connector, operations on the PC (camera control using the control software GXLink) can be set as allowed/prohibited.






- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "LOCK" from the TOP MENU (Figure 5-4).
- 3) Use the arrows   to select allow/prohibit operation of the control PC.



Figure 5-4 LOCK

OFF	PC operation allowed
PC LOCK	PC operation prohibited

5.2.2 ID Number Settings (ID)

The ID number can be set. ID numbers that can be set are from 0~127.












- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "ID" from the SYS MENU (Figure 5-5).
- 4) Use the arrows   to move columns and use arrows   to change the numerical value.
(Range of settings: 0~127)
- 5) Press SET  again to set the ID number.



Figure 5-5 ID

5.2.3 Date and Time Settings (DATETIME)

The date and time can be set.












- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "DATETIME" from the SYS MENU (Figure 5-6).
- 4) Use the arrows   to move columns and use arrows   to change the numerical value. Settings of the numbers for the date include year [00~99], month [01~12], day [01~31], hour [00~23], minute [00~59] and second [00~59].
- 5) Press SET  again to set the date and time.



Figure 5-6 DATETIME

5.2.4 Display/Do Not Display Settings for Information Superimposed on the Image (OSD DISP)

It is possible to set display/do not display for the information superimposed on the image (OSD: On Screen Display).









- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "OSD DISP" from the SYS MENU (Figure 5-7).
- 4) Use the arrows   to select display/do not display information superimposed on the image. (Figure 5-8)



Figure 5-7 OSD DISP

NONE	Do not display superimposed information
FRAME	Display only the frame counter as superimposed information
ALL	Display all superimposed information

OFF



FRAME



ALL



Figure 5-8 OSD DISP Settings

5.2.5 Display/hide the superimposed information by the camera mode (OSD MODE)

You can set display/hide the superimposed information on the image (OSD: On Screen Display) by camera mode.









- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "OSD MODE" from the SYS MENU (Figure 5-7).
- 4) Use the arrows   to select Display/do not display superimposed information by the camera mode. (Figure 5-9).



Figure 5-9 OSD MODE

- 8
- | | |
|---------------|--|
| ALWAYS | Display information superimposed with all cameras mode |
| STOP | Display information superimposed only at the time of STOP mode |

5.2.6 Trigger clock settings (OSD TIME)

At Trigger of superposition information, I can set it as an image at a trigger time display or the present time display (only VIEW, ARM, and REC mode).









- 5) While in the STOP mode, press MENU  to display the TOP MENU.
- 6) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 7) Use the arrows   to select "OSD TIME" from the SYS MENU (Figure 5-7).
- 8) Use the arrows   to select trigger clock setting. (Figure 5-10).



Figure 5-10 OSD TIME

- | | |
|-------------|---|
| TRIG | Display trigger time |
| CRNT | In VIEW, ARM, and REC mode, I display the present time.
(In STOP, PLAY, and LOOP mode, I display trigger time) |

The time of CRNT selection -- VIEW, ARM, and REC mode -- the present time -- table 示 -- the title of OSD is displayed as Date Time at last time (usually Trigger).

When the image trigger function is being used, I am displayed as Image Trigger.



Figure 5-11 Screen display

5.2.7 Setting to Display/Hide the Center Mark of the Image (CAFM DIS)

It is possible to set display/do not display for the center mark of the image (CAFM: Camera Alignment Fiducially Mark) .









- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "CAFM DISP" from the SYS MENU. (Figure 5-12)
- 4) Use the arrows   to select display/do not display for the center mark of the image. (Figure 5-13)



Figure 5-12 CAFM DIS

OFF	Do not display center mark of the image
WHT	Display the center mark of the image in white
BLK	Display the center mark of the image in black



Figure 5-13 CAFM DIS Settings

5.2.8 Frame Counter Display Settings (FRM DISP)

The units for the frame counter superimposed on the image can be set.









- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "FRM DISP" from the SYS MENU (Figure 5-14).
- 4) Use the arrows   to select the frame counter display (Figure 5-15).



Figure 5-14 FRM DISP

FRAME	Display number of current frame
TIME	Display the time of the current frame as a relative time from the trigger frame
ABS.TIME	Display the absolute time for the current frame
MEMORY%	Display the position of the current frame as a percentage of the recording time

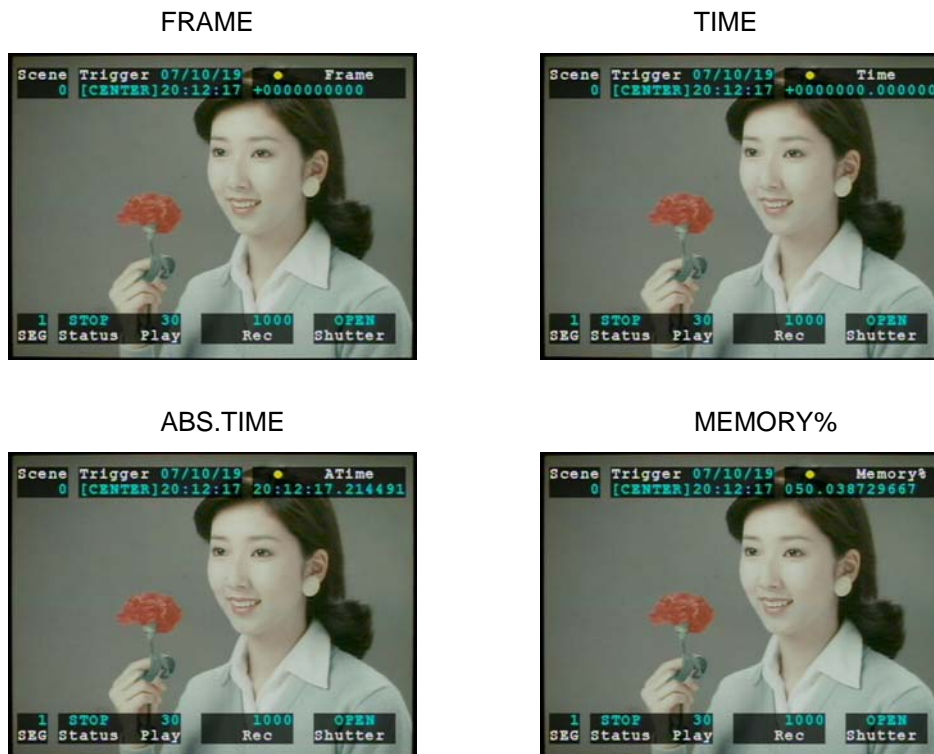


Figure 5-14 FRM DISP Settings

5.2.9 Selection of the Frame Time Standard (FRM TIME)

When setting the frame counter display to a relative time or an absolute time, the time standard can be selected.

- **Trigger Signal Input Time**
Using the trigger signal input time during recording as the standard, the time corresponding to the recording speed is calculated for the next frame (Figure 5-16). The advantage of this setting is that it is easy to make the time between each frame uniform. However, the frame time cannot be displayed with EST synchronized signal recording.
- **Mid-point of the Exposure Start and End Times**
The mid-point of the sensor exposure start and end time becomes the frame time (Figure 5-13). If using the time stamp function, since the image and the time information is saved in the memory, the frame time for the EST synchronized signal recording is also displayed. However, if the automatic exposure function (AE) is set, the time between each frame is not uniform.

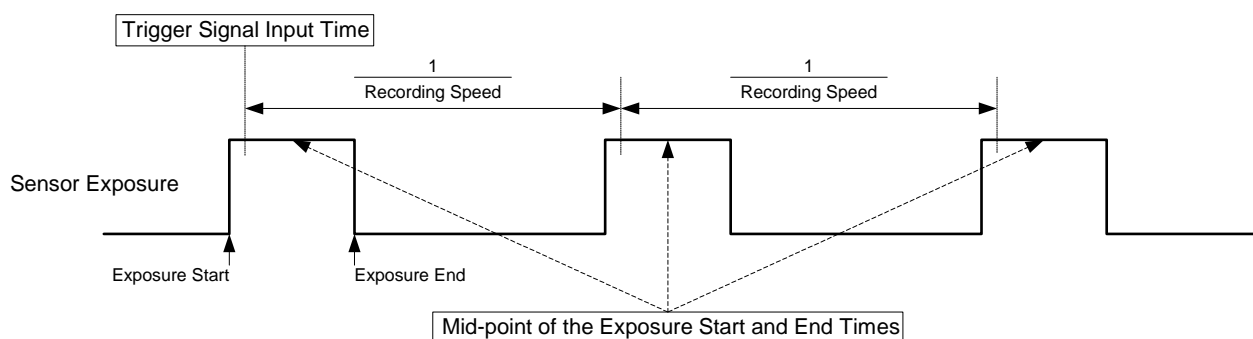


Figure 5-16 Standard Timing for the frame Time

- 1) While in the STOP mode, press MENU to display the TOP MENU.
- 2) Use the arrows to select "SYS MENU" from the TOP MENU and press SET to display the SYS MENU.
- 3) Use the arrows to select "FRM TIME" from the SYS MENU (Figure 5-17).
- 4) Use the arrows to select the frame time standard.



Figure 5-17 FRM TIME

TRIGGER EXPOSURE

Use the trigger signal input time as the standard

Use the mid-point of the exposure start and end time as the standard

5.2.10 Frame relative time display setting (REL TIME)

When setting the display (FRM DISP) of a frame counter as relative time (TIME) and having set the setting and the frame time display setting (FRM DISP) as exposure center time (EXPOSURE), you can choose the nominal of relative time.

Trigger frame time nominal

You set trigger frame time about the nominal of Rehm relative time.
Frame relative time becomes the time which pulled trigger frame time from frame time.

Trigger signal time nominal

You set trigger signal input time about the nominal of frame relative time.
Frame relative time becomes the time which pulled trigger signal input time from frame time.









- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "REL TIME" from the SYS MENU (Figure 5-18).
- 4) Use the arrows   to select frame relative time display setting.



Figure 5-18 REL TIME

FRAME	Trigger frame time nominal
TRIGGER	Trigger signal time nominal

5.2.11 Image Display/Do Not Display Settings (VIDEOOUT)

It is possible to set display/do not display for the image output to the viewfinder. This is used with a video signal converter.









- 5) While in the STOP mode, press MENU  to display the TOP MENU.
- 6) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 7) Use the arrows   to select "VIDEOOUT" from the SYS MENU (Figure 5-19).
- 8) Use the arrows   to select display/do not display the image.











Figure 5-19 VIDEOOUT

OFF Do not display the image
ON Display the image

5.2.12 Remote Control Operation Sound Settings (BEEP)

The operation sound for the remote control JPAD3 can be set ON/OFF.

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "BEEP" from the SYS MENU (Figure 5-20).
- 4) Use the arrows   to select the remote control operation sound.

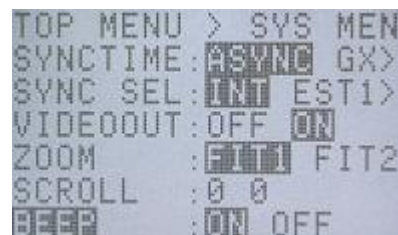


Figure 5-20 BEEP


ON Operation sound
OFF No operation sound

CAUTION) Remote Control Operation Sound Settings returns to initialization, when the power source was turned OFF, or when a restarting is carried out.






5.2.13 Auto View Function Settings (AUTOVIEW)

The auto view functions can be set.

The auto view function automatically switches from REC mode to VIEW mode once recording has been completed.

Once memory segmented recording has been completed, that memory segment (where recording has been completed) automatically switches to the VIEW mode. At this point, press VIEW/ARM  to switch to the next memory segment and switch to the ARM mode.

Auto view cannot be used for a recording method in the AUTO mode or the LOOP mode. If the recording method is set to the AUTO mode or LOOP mode, the auto view function will not function.

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows  to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows  to select "AUTOVIEW" from the SYS MENU (Figure 5-21).
- 4) Use the arrows  to select the auto view function.

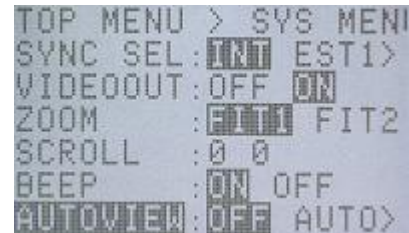


Figure 5-21 AUTOVIEW

- OFF** Auto view function OFF
- AUTO** The auto view function is repeated until the final memory segment (switches to memory segments where recording has been completed, cannot overwrite images)

At this time, the warning message of the ban on a substitute is displayed on a video display screen. (Figure 5-22)

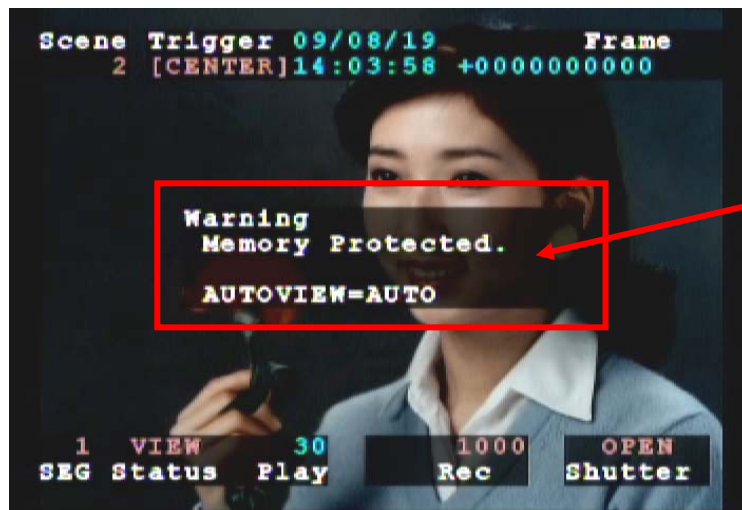



Figure 5-22 Warning message

- LOOP** The auto view function is repeated until stopped (press STOP ) (switches to memory segments where recording has been completed, cannot overwrite images) (After recording the last memory segment, it returns to the first memory segment)

CAUTION) Images saved to the memory are deleted when overwritten by a new image when switched to the ARM mode. Switch to the ARM mode only after verifying whether or not it is acceptable to erase the images saved in the next memory segment.

Save important images to a USB compatible memory media or to the control PC. Refer to **【2.9 Save to USB compatible storage media】** or **【GXLink User's Manual】** for the method of saving images.










5.2.14 Display/Do Not Display Warning Settings (WARNING)

It is possible to set display/do not display warning messages for live images.

- **Battery Warning (BATTERY)**
Warning when the voltage of the input power source is low or abnormal.
- **RTC Battery Warning (RTC BATT)**
Warning when the internal timer battery voltage is low.
- **Abnormal Recording Speed Warning (FRM RATE)**
Warning when the recording speed cycle is not within the tolerance range.
- **Abnormal Interruption of Camera Display Warning (IRQ)**
Warning when the recording display interruption signal goes out.
- **Black balance data mismatching warning (BLK BAL)**
If a fixed pattern noise peculiar to a sensor rectifies and it searches for higher definition image quality, please maintain black balance just before a radiography.
When maintaining black balance, it is necessary to make it the same frame size as the time of a radiography, a recording speed, and a shutter setting.
You can display warning, when "frame size, a recording speed, or a shutter" is changed after maintaining black balance.
If black balance is immediately restarted when warning is displayed, you can perform the right black balance amendment.

However, it may be necessary to display warning at every radiography by the employment which certainly maintains black balance.

You can set black balance data mismatching warning as OFF.

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "WARNING" from the SYS MENU and press SET  to display the WARNING sub-menu. (Figure 5-23)
- 4) Select the warnings to be set and use the arrows   to select display/do not display for the warnings.

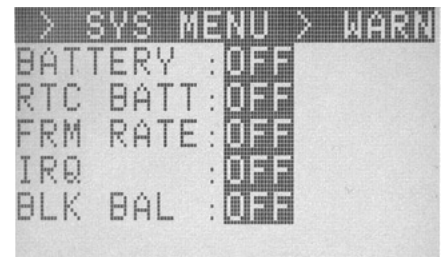













Figure 5-23 WARNING

BATTERY	ON	Display battery remaining warning
	OFF	Do not display battery remaining warning
RTC BATT	ON	Display RTC battery warning
	OFF	Do not display RTC battery warning
FRM RATE	ON	Display abnormal recording speed warning
	OFF	Do not display abnormal recording speed warning
IRQ	ON	Display abnormal camera display interruption warning
	OFF	Do not display abnormal camera display interruption warning
BLK BAL	ON	Display black balance data mismatching warning
	OFF	Do not display black balance data mismatching warning

5.2.15 System Information Display (INFO)

Displays the system information. These settings cannot be changed.

- Model name (MODEL)
- Firmware version (VERSION)
- Camera ID number (CID)
- Memory capacity (MEM SIZE)
- Hardware revision (REVISION)
- Network connections (NETWORK)
- IP address, sub net mask (IP ADDR)
- MAC address (MAC ADDR)
- Total operation time (ELAPSED)

- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "INFO" from the SYS MENU and press SET  to display the INFO sub menu (Figure 5-24).
- 4) Use the arrows   and the arrows   to verify all of the system information.

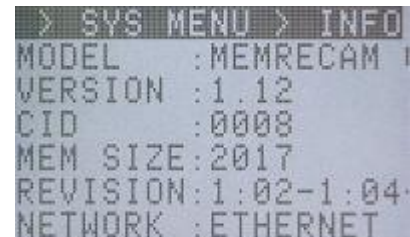
















Figure 5-24 INFO

5.2.16 Network Settings (IP ADDR)

The IP address and sub net mask can be set.

- 1) While in the STOP mode, simultaneously press STOP , SET , and TRIG  to display the SYSTEM SETUP MENU.
- 2) Use the arrows   to select "IP ADDR" from the SYSTEM SETUP MENU and press SET  (Figure 5-25). The IP address and sub net mask will be displayed.
- 3) Use the arrows   to move columns and use the arrows   to change the numerical value.
- 4) Press SET  again to set the IP address and sub net mask.
- 5) Use the arrows   to select "REBOOT" and press SET  (Figure 5-26).

Restart the system using "REBOOT" to show the IP address and sub net mask.

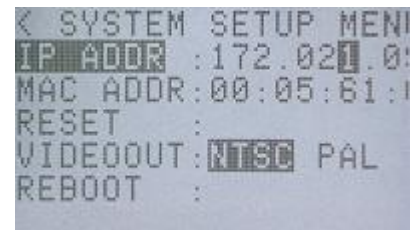


Figure 5-25 IP ADDR

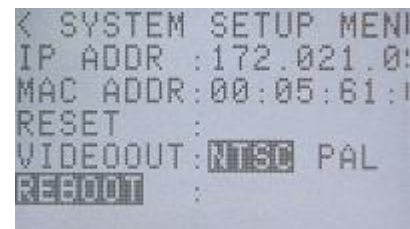








Figure 5-26 REBOOT

5.2.17 Reset Settings (RESET)

Reverts all of the settings to the factory settings.

- 1) While in the STOP mode, simultaneously press STOP , SET  and TRIG  to display the SYSTEM SETUP MENU.
- 2) Use the arrows   to select "RESET" from the SYSTEM SETUP MENU and press SET  (Figure 5-27).
All of the settings will revert to the factory settings.

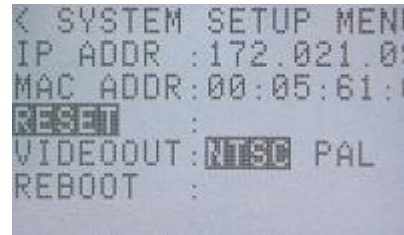





Figure 5-27 RESET

- 3) Use the arrows   to select "REBOOT" and press SET  (Figure 5-28).
Restart the system using "REBOOT" to show the new settings.

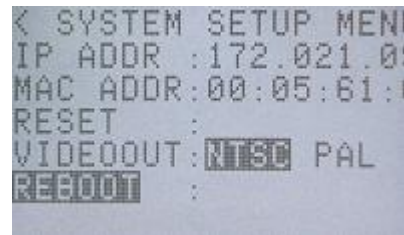









Figure 5-28 REBOOT

5.2.18 Video Output Method Selection (VIDEOOUT)

Either NTSC or PAL can be selected as the video output method.

- 1) While in the STOP mode, simultaneously press STOP , SET  and TRIG  to display the SYSTEM SETUP MENU.
- 2) Use the arrows   to select "VIDEOOUT" from the SYSTEM SETUP MENU (Figure 5-29).
- 3) Use the arrows   to select the video output method.

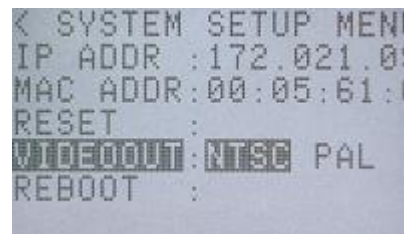


Figure 5-29 VIDEOOUT

NTSC The video output method is NTSC
PAL The video output method is PAL




- 4) Use the arrows   to select "REBOOT" and press SET  (Figure 5-30).
Restart the system using "REBOOT" to show the video method.



Figure 5-30 REBOOT

6

Troubleshooting

6.1 Troubleshooting

The following suggestions are provided on the causes of potential problems during use of the MEMRECAM GX-3 and their solutions.

6.1.1 The ARM Mode Cannot Be Accessed

Cause ①

After recording in the AUTO mode, the memory segment where recording has been completed is memory protected and overwriting data by recording (ARM mode) is prohibited.

Solution

Try the following solutions.

- ◆ Recording in the AUTO mode can be performed again by erasing the data in the memory. Erase the data in the memory according to the **【3.2.12 Memory Segment Settings】**.
- ◆ Select a recording method other than the AUTO mode from **【3.2.14 Recording Method Selection】** to enable data to be overwritten.

Caution) Before performing the aforementioned solutions, verify that the data can be erased or overwritten by recording. Essential images should be saved on a USB compatible storage media or the control PC. Refer to **【2.9 Save to USB compatible storage media】** or **【GXLink User's Manual】** for the method of saving images.

Cause ②

After setting the auto view function in the AUTO mode and recording, the memory segment where recording has been completed is memory protected and overwriting data by recording (ARM mode) is prohibited.

Solution

Try the following solutions.

- ◆ Recording can be performed using the auto view function set in the AUTO mode by erasing the data in the memory. Erase the data in the memory according to the **【3.2.11 Memory Segment Settings】**.
- ◆ Turn the auto view function OFF or set to LOOP according to **【5.2.13 Auto View Function Settings】** to enable overwriting data.

Caution) Before performing the aforementioned solutions, verify that the data can be erased or overwritten by recording. Essential images should be saved on a USB compatible storage media or the control PC. Refer to **【2.9 Save to USB compatible storage media】** or **【GXLink User's Manual】** for the method of saving images.

6.1.2 Trigger Input Does Not Work With The Remote Control J-PAD3

Cause

When the recording method is set to burst recording, the trigger input does not work with the remote control J-PAD3, and only functions with external trigger input.

Solution

Input external trigger signals from the TRIG1 on rear panel or J3 cable TRIG2 (option) during burst recording.

6.1.3 External Trigger Input Does Not Work

Cause ①

The two systems for external trigger input include the TRIG1 on rear panel and the J3 cable TRIG2 (option). When one was set as the valid trigger input, it is possible that the trigger system used did not match the trigger system set.

Solution

Follow **【3.2.13 External Trigger Signal Selection】** to select the trigger system that matches the trigger system to be used.

Cause ②

It is possible that signals valid as recording trigger signals were not input. Also, if the polarity setting to detect the trigger is incorrect, the trigger input for the desired timing won't work.

Solution

Verify input of the valid trigger signals using **【7.5 Input/Output Connectors】** and **【APPENDIX A】**. Also, follow **【3.2.18 External Input/Output Signal Polarity Selection】** to make sure that the correct polarity is either positive or negative to enable trigger input with the desired timing.

6.1.4 Recording is completed before putting in a trigger

Cause

The image trigger function may be set to ON.

Solution

Please check a setting by the display of **【3.2.7 Image trigger setting (IMG TRIG)】** and OSD. When you do not use an image trigger function, please turn OFF.

6.1.5 The EST Signals Are Not Synchronized

Cause

There is a possibility that the proper EST signal is not input. Also, if the polarity setting to detect the EST signal is incorrect, synchronized recording for the desired timing won't work.

Solution

Verify that the proper EST signal is input based on **【3.2.16.2.1 Precautions for Use, 【7.5 Input/Output Connector】** and **【APPENDIX B】**. Also, follow **【3.2.18.1 External Input/Output Signal Polarity Selection】** to make sure that the correct polarity is either positive or negative to enable EST synchronized signal recording with the desired timing

6.1.6 Not Synchronized with the IRIG Time

Cause ①

It is possible that the synchronization time is not set to the IRIG time.

Solution

Set the synchronization time to IRIG time according to **【3.2.14 Synchronization Time Settings】** .

Cause ②

It is possible that the proper IRIG-B time code is not input.

Solution

Verify **【7.5 Input/Output Connector】** , and **【APPENDIX E】** and input the proper IRIG-B time code.

6.1.7 Response to System Crashes

If, for some reason, the system crashes, unplug the AC adapter power switch and reboot. If it starts up properly, it returns to the state immediately prior to recording so download the images backed up in the memory using a USB storage media.

7

Specifications

7.1 Imager

7.1.1 Image Sensor

Approximately 2.2 inch 1,310,000 pixel color or black and white image sensor (CMOS sensor)

7.1.2 Recording Speeds

- 1) With Preset Recording speeds 50, 60, 100, 250, 500, 750, 1,000, 1,500, 2,000, 2,500, 3,000, 4,000, 5,000, 6,000, 7000, 8,000, 10,000, 15,000, 20,000, 25,000, 30,000, 40,000, 50,000, 60,000, 80,000, 100,000, 150,000, 198,000
- 2) With Custom Recording speeds 50~198,000 pps, 1pps increments
- 3) Using EST and Custom Recording speed Function 0~198,030 pps
Note) pps: picture per second, frames/second

7.1.3 Recording Speed and Pixels

- 1) The maximum recording speed during presets and the pixels/area size

Freame Size(Maximum Recording Speed)	Pixels	Image Area Size
Full :SXGA (1,500pps or less)	1280(H)X1024(V)	27.78(H)X22.22(V) mm
SXGA 4:3 (1,500pps or less)	1280(H)X960(V)	27.78(H)X20.83(V) mm
Split (2,000pps)	1280(H)X800 (V)	27.78(H)X17.36(V) mm
Split 4:3 (2,000pps)	1152 (H)X864(V)	24.99(H)X18.75(V) mm
Split (2,000pps)	1024(H)X1024(V)	22.22(H)X22.22(V) mm
HDTV720 (2,000pps or less)	1280(H)X720(V)	27.78(H)X15.62(V) mm
XGA (2,500pps or less)	1024(H)X768(V)	22.22(H)X16.67(V) mm
Split (3,000pps)	800(H)X800(V)	17.36(H)X17.36(V) mm
Split 4:3 (3,000pps)	896(H)X672(V)	19.44(H)X14.58(V) mm
Split 16:9 (3,000pps)	1024(H)X576(V)	22.22(H)X12.50(V) mm
Split (4,000pps)	704(H)X704(V)	15.28(H)X15.28(V) mm
Split 4:3 (4,000pps)	768 (H)X576(V)	16.67(H)X12.50(V) mm
Split (5,000pps)	624(H)X624(V)	13.54(H)X13.54(V) mm
Split 4:3 (5,000pps)	704(H)X528(V)	15.28(H)X11.46(V) mm
VGA (6,000pps or less)	640(H)X480(V)	13.89(H)X10.42(V) mm
Split (6,000pps)	512(H)X512(V)	11.11(H)X11.11(V) mm
Split (7,000pps)	512(H)X512(V)	11.11(H)X11.11(V) mm
Split 4:3 (8,000pps or less)	512(H)X384 (V)	11.11(H)X8.33(V) mm
Split (10,000pps)	452(H)X368(V)	9.81(H)X7.99(V) mm
CIF (10,000pps or less)	384(H)X288(V)	8.33(H)X6.25(V) mm
Split (15,000pps)	436(H)X192(V)	9.46(H)X4.17(V) mm
QVGA (15,000pps or less)	320(H)X240(V)	6.94(H)X5.21(V) mm
Split (20,000pps)	320 (H)X192(V)	6.94(H)X4.17(V) mm
Split 4:3 (20,000pps)	256(H)X192(V)	5.56(H)X4.17(V) mm
Split 4;3 (30,000pps)	192(H)X144(V)	4.17(H)X3.12(V) mm
Split (40,000pps)	144(H)X144(V)	3.12(H)X3.12(V) mm
Split (50,000pps)	128(H)X128(V)	2.78(H)X2.78(V) mm
Split (60,000pps)	96(H)X96(V)	2.08(H)X2.08(V) mm
Split (80,000pps)	64(H)X64(V)	1.39(H)X1.39(V) mm
Split (100,000pps)	64 (H)X 32(V)	1.39(H)X0.69(V) mm
Split (150,000pps)	16(H)X64(V)	0.35(H)X1.39(V) mm
Split (198,000pps)	4(H)X16(V)	0.09(H)X0.35(V) mm

Note 1) The number of pixels saved in the memory is the same as the number of available pixels.

Note 2) The sensor central accuracy relative to the central light axis is ± 0.5 mm.

- 2) Custom Settings for the Frame Size
The horizontal pixels can be set in 4 pixel increments, and the vertical pixels can be set in 16 pixel increments.

7.1.4 Sensitivity

- 1) Color Approximately 1,200 lx (F/4, gain NORMAL, 1000pps)
Corresponds to ISO2500/5000/10000 (gain LOW/NORMAL/HIGH)
- 2) Black and White Approximately 300 lx (F/4, gain NORMAL, 1000pps)
Corresponds to ISO10000/20000/40000 (gain LOW/NORMAL/HIGH)

Note) Subject illuminance refers to the illuminance when the output signal for the subject at 89% of the reflectance is 100%.
The aperture value is the lens aperture at that point

7.1.5 Shutter

- 1) Shutter method Electronic shutter
- 2) Preset exposure times OPEN(=1/ recording speed), 1/100, 1/250, 1/500, 1/1,000, 1/2,000, 1/5,000, 1/10,000, 1/20,000, 1/50,000, 1/100,000, 1/200,000, 1/333,333 seconds

Shutters with Fixed Exposure Time Settings (Example:Pixels 1280X1024)

Recording Speed Exposure Time (Sec) \ (pps)	50	60	100	250	500	750	1000	1500
1/50	×	×	×	×	×	×	×	×
1/60	×	×	×	×	×	×	×	×
1/100	○	○	○*	×	×	×	×	×
1/250	○	○	○	○*	×	×	×	×
1/500	○	○	○	○	○*	×	×	×
1/750	△	△	△	△	△	○*	×	×
1/1,000	○	○	○	○	○	○	○*	×
1/1,500	△	△	△	△	△	△	△	○*
1/2,000	○	○	○	○	○	○	○	○
1/5,000	○	○	○	○	○	○	○	○
1/10,000	○	○	○	○	○	○	○	○
1/20,000	○	○	○	○	○	○	○	○
1/50,000	○	○	○	○	○	○	○	○
1/100,000	○	○	○	○	○	○	○	○
1/200,000	○	○	○	○	○	○	○	○
1/333,333	○	○	○	○	○	○	○	○

Note 1) It is not possible to set exposure times longer than 1/recording speed.

Note 2) ○ refers to shutter exposure times that can be set. × and △ refers to shutter exposure times that cannot be set with a preset.

Note 3) △ refers to the ability to custom set shutter.

Note 4) * refers to an open shutter (=1/ recording speed)× not refers to the ability to custom

Note 5) If using a shutter exposure time where the settings for the recording speed and pixels cannot be changed, the shutter is open or the exposure time is at the minimum. If setting the shutter to open or the minimum exposure time, those settings will remain even if the recording speed or pixels are changed.

Note 6) Since a frame size setting and the fluctuation of the black level by a temperatures are large when using the high-speed shutter for 1 to 5 microseconds, I recommend maintaining and photoing black balance strongly.

- 3) Custom Shutter Exposure Times
1~9996 microseconds, 1 or 2 microsecond increments

Possible Settings and Intervals for Exposure Times

Photographic Speed (pps)	Pixels (HxV)	Setting (us)		Setting (us)
		Maximum	Minimum	
100 or less	1280x1024	9994	1	1 or 2
250	1280x1024	3995	1	1 or 2
500	1280x1024	1995	1	1 or 2
1,000	1280x1024	995	1	1 or 2
1,500	1280x1024	662	1	1 or 2
2,000	1024x1024	494	1	1 or 2
3,000	800x800	329	1	1 or 2
4,000	704x704	246	1	1 or 2
5,000	624x624	196	1	1
6,000	640x480	163	1	1
7,000	512x512	139	1	1
8,000	512x384	122	1	1
10,000	452x368	97	1	1
15,000	436x192	64	1	1
20,000	320x192	48	1	1
30,000	192x144	31	1	1
40,000	144x144	22	1	1
50,000	128x128	18	1	1
60,000	96x96	14	1	1
80,000	64x64	10	1	1
100,000	64x32	8	1	1
150,000	16x64	4	1	1
198,000	4x16	3	1	1

Note 1) The exposure times that can be set with the custom shutter are automatically calculated by the firmware.

7.1.6 Automatic Exposure

With the automatic exposure function ON, the shutter exposure time can be automatically adjusted from the shortest exposure time (10usec) to the longest exposure time (designated by the shutter exposure time).

7.1.7 DRES Mode (Dynamic Range Extender)

The brightness is determined in pixel units and only the pixels above a given level are exposed by the shutter speed determined in the DRES mode. Pixels below the given level are exposed by the normal shutter speed.

It is possible to take extended dynamic range images by suppressing the saturation of the areas with high luminance.

7.1.8 Lens Mount

F-mount (full size) or C-mount.

When it is used by MEMRECAM GX-3, depending on representation resolution, vignetting may produce some F mount lenses. (Example: Nikon DX Nikkor Lens)

Use the special C-mount adapter for the C-mount. However, if using a standard C-mount 2/3" lens, a valid pixel setting of 384x288 or less is recommended. If this is exceeded, tunnel vision may occur.

7.1.9 Compatibility with the Previous Series

The MEMRECAM GX-3 uses shutter exposure start timing as the standard. The previous MEMRECAM ci, fx series use shutter exposure end timing as the standard.

Therefore, the exposure time shifts when there is a multi camera completely synchronized system with a combination of the previous camera series and the GX-3.

Since the GX-3 has a compatible mode for the previous series of cameras, it is necessary to set the exposure time (EXP TIME) to K3 compat for mixed systems.

With only GX-3, or with multi camera synchronized systems with cameras from other companies using exposure start timing as the standard, set the exposure time (EXP TIME) to GX native.

The MEMRECAM GX-3 uses shutter exposure start timing as the standard. The previous MEMRECAM ci, fx series use shutter exposure end timing as the standard.

Note 1) With a combination of MEMRECAM fx-K4/K5 and GX-3, set the K4/K5 exposure time to 'standard' and either set the GX-3 exposure time to 'K4 compat' or set the K4/K5 exposure time to 'legacy' and the GX-3 exposure time to 'K3 compat'.

Note 2) With a multi camera synchronized system, if the fx series cameras other than the MEMRECAM ci series and fx-K4/K5, have open shutters at less than 1000pps, the exposure time will shift so make sure to use a shutter.

Note 3) You set Exposure Timing as K3 compat, and further, if trigger timing is set up to 0% by CUSTOM, a trigger flame may not be recorded.

7.2 Recorder

7.2.1 Memory

- | | |
|-------------------------|--|
| 1) Installed Memory | 2GB, 4GB |
| 2) With memory segments | (2GB)256MB×8, 512MB×4, 1GB×2, 2GB×1
(4GB)256MB×16, 512MB×8, 1GB×4, 2GB×2, 4GB×1 |

7.2.2 Recording Bit Length

Records as follows with a sensor output of 12 bit (0~4095).

- 1) 12 bit Records at a sensor output of 12 bit. High image quality.
- 2) 10 bit Saves the top 10 bit of the 12bit sensor output and does not save the bottom 2 bit. Standard image quality.
- 3) 8 bit The top 10 bit (0~1024) are saved as 0~127, 128~255 saved as 128~191, 256~511 are saved as 192~223 and 512~1023 are saved as 224~255. The image quality is low but the recording time is extended and the data size is reduced.

7.2.3 Recording Times

The next table shows the recording times by combining the possible recording speeds with preset settings and the frame sizes. "x" indicates that settings cannot be combined.

(Example: 4GB model, 10 bits, and no segment splitting)

Recording Times for Preset Settings (sec) (1280x1024~896x672)

Frame size [pixel] Recording speed [pps]	1280X1024	1280X960	1280X800	1152X864	1024X1024	1280X720	1024X768	800X800	896X672
50	52.04	55.54	x	x	x	74.18	86.99	x	x
60	43.37	46.28	x	x	x	61.81	72.49	x	x
100	26.02	27.77	x	x	x	37.09	43.50	x	x
250	10.41	11.11	x	x	x	14.84	17.40	x	x
500	5.20	5.55	x	x	x	7.42	8.70	x	x
750	3.47	3.70	x	x	x	4.95	5.80	x	x
1000	2.60	2.78	x	x	x	3.71	4.35	x	x
1500	1.73	1.85	x	x	x	2.47	2.90	x	x
2000	x	x	1.67	1.72	1.63	1.85	2.17	x	x
2500	x	x	x	x	x	x	1.74	x	x
3000	x	x	x	x	x	x	x	1.78	x
4000	x	x	x	x	x	x	x	x	1.42
5000	x	x	x	x	x	x	x	x	x
6000	x	x	x	x	x	x	x	x	x
8000	x	x	x	x	x	x	x	x	x
10000	x	x	x	x	x	x	x	x	x
15000	x	x	x	x	x	x	x	x	x
20000	x	x	x	x	x	x	x	x	x
25000	x	x	x	x	x	x	x	x	x
30000	x	x	x	x	x	x	x	x	x
40000	x	x	x	x	x	x	x	x	x
50000	x	x	x	x	x	x	x	x	x
60000	x	x	x	x	x	x	x	x	x
80000	x	x	x	x	x	x	x	x	x
100000	x	x	x	x	x	x	x	x	x
150000	x	x	x	x	x	x	x	x	x
198000	x	x	x	x	x	x	x	x	x

Recording Times for Preset Settings (sec) (1024x576~464x368)

Frame size [pixel] Recording speed [pps]	1024X576	704X704	768X576	624X624	704X528	640X480	512X512	512X384	452X368
50	×	×	×	×	×	223.27	×	349.03	×
60	×	×	×	×	×	186.05	×	290.86	×
100	×	×	×	×	×	111.63	×	174.51	×
250	×	×	×	×	×	44.65	×	69.81	×
500	×	×	×	×	×	22.33	×	34.90	×
750	×	×	×	×	×	14.88	×	23.27	×
1000	×	×	×	×	×	11.16	×	17.45	×
1500	×	×	×	×	×	7.44	×	11.63	×
2000	×	×	×	×	×	5.58	×	8.73	×
2500	×	×	×	×	×	4.47	×	6.98	×
3000	1.94	×	×	×	×	3.72	×	5.82	×
4000		1.73	1.94			2.79	×	4.36	×
5000	×	×		1.76	1.84	2.23	×	3.49	×
6000	×	×				1.86	2.18	2.91	×
8000	×	×	×	×	×	×	1.87	×	×
10000	×	×	×	×	×	×	×	2.18	×
15000	×	×	×	×	×	×	×	×	2.06
20000	×	×	×	×	×	×	×	×	×
25000	×	×	×	×	×	×	×	×	×
30000	×	×	×	×	×	×	×	×	×
40000	×	×	×	×	×	×	×	×	×
50000	×	×	×	×	×	×	×	×	×
60000	×	×	×	×	×	×	×	×	×
80000	×	×	×	×	×	×	×	×	×
100000	×	×	×	×	×	×	×	×	×
150000	×	×	×	×	×	×	×	×	×
198000	×	×	×	×	×	×	×	×	×

Recording Times for Preset Settings (sec) (384x288~96x96)

Frame size [pixel] Recording speed [pps]	384X288	436X192	320X240	320X192	256X192	192X144	144X144	128X128	96X96
50	620.64	×	893.66	×	×	×	×	×	×
60	517.20	×	744.71	×	×	×	×	×	×
100	310.32	×	446.83	×	×	×	×	×	×
250	124.13	×	178.73	×	×	×	×	×	×
500	62.06	×	89.37	×	×	×	×	×	×
750	41.38	×	59.58	×	×	×	×	×	×
1000	31.03	×	44.68	×	×	×	×	×	×
1500	20.69	×	29.79	×	×	×	×	×	×
2000	15.52	×	22.34	×	×	×	×	×	×
2500	12.41	×	17.87	×	×	×	×	×	×
3000	10.34	×	14.89	×	×	×	×	×	×
4000	7.76	×	11.17	×	×	×	×	×	×
5000	6.21	×	8.94	×	×	×	×	×	×
6000	5.17	×	7.45	×	×	×	×	×	×
8000	4.43	×	6.38	×	×	×	×	×	×
10000	3.88	×	5.59	×	×	×	×	×	×
15000	3.10	×	4.47	×	×	×	×	×	×
20000	×	2.73	2.98	×	×	×	×	×	×
25000	×	×	×	2.79	3.49	×	×	×	×
30000	×	×	×	×	×	4.13	×	×	×
40000	×	×	×	×	×	×	4.13	×	×
50000	×	×	×	×	×	×	×	4.18	×
60000	×	×	×	×	×	×	×	×	6.17
80000	×	×	×	×	×	×	×	×	×
100000	×	×	×	×	×	×	×	×	×
150000	×	×	×	×	×	×	×	×	×
198000	×	×	×	×	×	×	×	×	×

Recording Times for Preset Settings (sec) (64x64~4x16)

Frame size [pixel] Recording speed [pps]	64X64	64X32	16X64	4X16
50	x	x	x	x
60	x	x	x	x
100	x	x	x	x
250	x	x	x	x
500	x	x	x	x
750	x	x	x	x
1000	x	x	x	x
1500	x	x	x	x
2000	x	x	x	x
2500	x	x	x	x
3000	x	x	x	x
4000	x	x	x	x
5000	x	x	x	x
6000	x	x	x	x
8000	x	x	x	x
10000	x	x	x	x
15000	x	x	x	x
20000	x	x	x	x
25000	x	x	x	x
30000	x	x	x	x
40000	x	x	x	x
50000	x	x	x	x
60000	x	x	x	x
80000	10.32	x	x	x
100000	x	16.27	x	x
150000	x	x	21.05	x
198000	x	x	x	135.57

7.2.4 Live Image Display

The live images during camera photography (VIEW, ARM, REC) are displayed in color.

- 1) NTSC Update rate:30 frames/sec
- 2) PAL Update rate:25 frames/sec

7.2.5 Recording Trigger Mode

- 1) Recording Method
 - Normal Normal trigger mode
 - Event Trigger The initial trigger signal is the trigger and the second and subsequent trigger signals are saved as events. With an input pulse of 15 (16 when combined with the initial trigger), it is possible to use a frame jump or an on-screen display mark.
 - Burst Trigger Recording performed when the trigger signal is ON
 - Multi Trigger The selected memory segments are segmented into 1~16 blocks (can be increased by individual units), and recording is performed by automatically switching each trigger signal into blocks.
- 2) Trigger Timing (normal, event, multi trigger settings)
 - START The trigger point is the frame about 5% past the beginning of the recording memory
 - CENTER The trigger point is the mid-point (about 50%) of the recording memory
 - END The trigger point is the frame about 5% just before the end of the recording memory
 - CUSTOM The trigger point is a frame for a predetermined numerical value (corresponding to -100~100%). It can be set in 1% increments. Reference) - 100%~- 1% corresponds to the delay trigger

Note 1) Writing begins to the recording memory in the ARM mode even without trigger input. After switching to the ARM mode, images recorded previously cannot be played back.

Note 2) The recording range can be slightly adjusted depending on the trigger timing.

Note 3) Depending on the recording method settings, the recording speed and the relationship of the trigger timing, it may not be possible to record into the entire recording memory, and only partial recording is possible. For example, if END is set, recording is ended at a point about 5% from the trigger input to the recording memory so if there is trigger input before 95% or more has elapsed from the start of ARM, the portion shorter than 95% will not be saved.

7.2.6 Synchronized Data Save During Recording

- 1) Closed Caption Method
(Method where images and information are saved separately but displayed together)
The recorded scene number, recorded trigger mode setting, recording speed, frame size, shutter exposure time, recorded image quality setting, recording comments and the trigger time are saved in the system controller at the time of trigger input.
- 2) Synchronized Save Method
(method where images and information are saved and displayed together)
The internal standard time information (or IRIG-B time), exposure start time, exposure end time, trigger signal, event signal and IRIG lock are saved in the image memory.
- 3) Frame Synchronized Save Data (time stamp)
 - Exposure start time (in min, sec and usec units)
 - Exposure end time (in min, sec and usec units)
 - Frame count (memory address information)
 - Trigger time (in day, hour, min, sec and usec units)
 - Sequence count (save sequence information)
 - Trigger, EST, event, IRIG lock (flag bit identification)
 - Recorded time (day, hour, min, sec)

The time stamp can be turned ON/OFF.

7.2.6 Synchronized Data Save During Recording

- 1) Closed Caption Method
(method where images and information are saved separately but displayed together)
The recorded scene number, recorded trigger mode setting, recording speed, frame size, shutter exposure time, recorded image quality setting, recording comments and the trigger time are saved in the system controller at the time of trigger input.
- 2) Synchronized Save Method
(method where images and information are saved and displayed together)
The internal standard time information (or IRIG-B time), exposure start time, exposure end time, trigger signal, event signal and IRIG lock are saved in the image memory.
- 3) Frame Synchronized Save Data (time stamp)
 - Exposure center time (in day, hour, min, sec and usec units)
 - Trigger time (in day, hour, min, sec and usec units)
 - Event
 - IRIG lock

The time stamp can be turned ON/OFF.

7.3 Video Converter

- 1) Output Signal
Image update rate
Display area
NTSC / PAL method analog signal, 75Ω, 1 V(p-p)
30 frame/sec (NTSC), 25frame/sec (PAL)
640x480(NTSC), 768x576(PAL)
 - 2) Gradation
Y, Cb, Cr each 8 bit (internal digital final stage)
 - 3) Image Quality Settings
Gain
White balance
Enhance
Gamma
Chroma
Knee
RGB matrix
LUMINANC
LOW, NORMAL, HIGH
AUTO, 3100K, 5000K, 9000K, REG
OFF, LOW, NORMAL, HIGH
OFF, LOW, NORMAL
0%, 50%, 100%, 150%, 200%
OFF, ON
OFF, ON
NORMAL, LINEAR, CUSTOM (Only select)
 - 4) Display
Zoom
FIT1 (display the entire screen at 100%),
FIT2 (NTSC:display the entire screen reduced about 80%,
PAL:display the entire screen reduced about 83%),
1/2, 1x, 2x, 4x

Scroll
The zoomed image is cut to the display area for display.
Coordinates are set using the center of the image as the origin,
and the display position can be moved.
 - 5) Segment frame display
Segment frame displayed in VIEW mode or LOW LIGHT mode.
Can be used in conjunction with zoom display.
 - 6) Display mark at the center of the image
Cross can be displayed as the mark at the center of the image:
CAFM(Camera Alignment Fiducial Mark). Select either white or black.
 - 7) Playback display
Playback speed (NTSC)
Playback speed (PAL)
Frame jump
Playback mode
Playback range settings
Forward, 1~1920 frames/sec, both forward and reverse
Forward, 1~2000 frames/sec, both forward and reverse
Trigger frame, recording start frame, recording end frame
Single playback (PLAY mode), loop playback (LOOP mode)
Playback start frame and playback end frame settings
- Note) In the reproduction speed beyond 30 frame/sec, it skip and display an image (skipping an intermediate frame). Therefore, if it plays at the rate of below 30 frame/sec recording on VTR etc., all the recorded images are recordable.(In PAL, the number of 30 is set to 25 here)
A frame number corresponds with an image.
A still picture image does not become like a double exposure.
- 8) Video output control
Video output can be set to ON/OFF

7.4 System Controls

7.4.1 Status Display on the Main Unit LED

1) POWER LED(PW)

Lit green	Power ON (Normal)
Lit red	Power ON (Fail)
OFF	Power OFF

Note) Fail indicates the presence of any one of camera startup, failure detected, abnormal power voltage detected or elevated sensor temperature detected

2) CAMERA MODE LED (CM)

Red	REC mode (Camera image output, saving in the camera image memory after trigger detection)
Blue	STOP mode(Memory image output. Immediately after startup, either the playback mode or the transmission mode)
White	VIEW mode(Camera image output, memory contents retained after save completed)
Magenta	ARM mode (camera image output, memory contents discarded after save completed and camera image being saved in memory)
OFF	Power OFF, or starting up
Flashing	Set in EST mode, and EST pulse input Only with VIEW, ARM, REC modes

3) MEMORY BACKUP LED (MB):As stated in 7.4.4

4) ETHERNET LED (ET)

Lit green	Network connection
Flashing green	Network communicating
OFF	Network not connected or power OFF

5) USB LED (UB)

Lit green	Bus power ON
OFF	Bus power OFF

7.4.2 Video Output On Screen Display

- 1) Mode display LLIGHT (LOW LIGHT), STOP, VIEW, ARM, REC, FAIL
- 2) Recording speed 50~198,000 (pps units in integers), EST
- 3) Shutter 1/100~1/333333, 1~9996(micro units in integers)
- 4) Trigger timing START, CENTER, END, -100~+100(% units in integers)
- 5) Frame count The current screen display frame number (integer) with the trigger frame at 0, or the relative time for the current screen display with the trigger frame as time 0 (fx compatible function, unit: microseconds, 24 hour system). Switch according to the menu.
- 6) Time Exposure center time (unrelated to the trigger frame) for the current screen display

7) Warning display	Abnormal recording speed (ON/OFF) Abnormal camera interruption (ON/OFF) Sensor temperature out of valid range Camera head not connected Abnormal camera head communication Abnormal camera head EEPROM Abnormal recording start Abnormal recording cancel Abnormal I2C device communication Abnormal input voltage (low voltage : 19V or less) Abnormal input voltage (high voltage : 33V or more) Low memory backup battery warning (ON/OFF) Imminent cutoff of memory backup battery voltage VIEW/ARM start trigger signal assert BlackBalance data imbalance Startup error RTC battery out (ON/OFF) BlackBalance data generation error USB HDD format error USB HDD save error MCFF transmission error USB driver deadlock USB driver timeout
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7.4.3 Remote Control J-PAD3

System controller settings and verification can be made with the remote control J-PAD3.
Bold indicates factory settings.

- 1) Status Display 1
 Displayed in the VIEW, ARM, REC and LOW LIGHT modes other than the menu mode.

·MODE	Display mode
·FRM RATE	Display recording speed, with a direct setting button
·FRM SIZE	Display frame size (valid pixels)
·SHUTTER	Display shutter, with a direct setting button
·TRIGGER	Display trigger, with a direct setting button
·ID	Display ID number
·SCENE	Display scene number
·PLAY	Display playback speed
·FRAME	Display frame counter
·TIME	Display frame time

- 2) Status Display 2
 Displayed in the STOP, PLAY and LOOP modes other than the menu mode.

·MODE	Display mode
·FRAME	Display frame counter
·TIME	Display frame time
·PLAY	Display playback speed
·FRM RATE	Display recording speed
·FRM SIZE	Display rime size (valid pixels)
·SHUTTER	Display shutter
·TRIGGER	Display trigger
·ID	Display ID number
·SCENE	Display scene number
·Bar display	Display playback range toolbar, playback range and current playback position displayed relative to all of the saved range

3) Recording Setup Menu (VIEW MENU)

Access this menu with the "MENU" button while in the VIEW mode. Set the items needed for recording.

· SCENE	Scene number settings, 0~65535 (automatic increments)
· TRIGGER	Trigger mode settings, START, CENTER , END, CUSTOM
· FRM RATE	Recording speed settings, refer to the 【7.1 imager】 (1000)
· FRM SIZE	Frame size settings, refer to the 【7.1 imager】 (1280x1024)
· CUSTOM F	Custom recording speed/frame size setting menu
/ PRIORITY	Priority settings, RATE , SIZE
/ FRM RATE	Recording speed settings
/ FRM SIZE	Frame size settings
· SHUTTER	Shutter exposure time settings, refer to the 【7.1 imager】 (OPEN)
· AOI	A light measurement area setting of an automatic exposure (acoustic emission) and an image trigger function (IMEG TRIG), FULL , CENTER, UPPER, LOWER, LEFT, RIGHT, CUSTOM
· IMG TRIG	Image trigger settings, OFF , LOW, MID, HIGH
· AE	Automatic exposure OFF/ON and brightness settings, OFF , LOW, NORMAL, HIGH
· DRES	DRES settings, OFF , LOW, MID, HIGH
· LOWLIGHT	Low light mode settings, 100 , 250, 500, 1000, CUSTOM
· GAIN	Gain settings, LOW, NORMAL , HIGH
· WHT BAL	White balance settings, AUTO , 3100, 5000, 9000, REG, SET
· ENHANCE	Enhance settings, OFF, LOW, NORMAL , HIGH
· GAMMA	Gamma settings, OFF, LOW, NORMAL
· CHROMA	Chroma settings, 0, 50, 100 , 150, 200
· KNEE	Knee settings, OFF, ON
· RGB COR.	RGB matrix settings, OFF , ON
· LUMINANC	Brightness characteristics settings, NORMAL , LINEAR
· DEPTH	Bits saved settings, 8, 10 , 12
· ZOOM	Zoom display settings, FIT1 , FIT2, 1/2, x1, x2, x4
· SCROLL	XY coordinate settings and display 0 0 (center of the screen) set using arrows. Trigger button targets the center of the screen.

4) General Setup Menu (TOP MENU)

Access this menu with the "MENU" button while in the STOP mode. Perform playback settings, system settings and saving data.

· BLK BAL	Black balance settings, OFF , REG, SET
· GAIN	Playback gain settings, LOW, NORMAL , HIGH
· WHT BAL	Playback white balance settings, AUTO , 3100, 5000, 9000, REG,
· ENHANCE	Playback enhance settings, OFF, LOW, NORMAL , HIGH
· GAMMA	Playback gamma settings, OFF, LOW, NORMAL
· CHROMA	Playback chroma settings, 0, 50, 100 , 150, 200
· KNEE	Playback knee settings, OFF, ON
· RGB COR.	RGB matrix settings, OFF , ON
· LUMINANC	Brightness characteristics settings, NORMAL , LINEAR
· LOCK	PC operation lock settings, OFF , PC LOCK
· MEM SEG	Memory segment menu, refer to 4.1)
· SYS MENU	System menu, refer to 4.2)
· SAVEMENU	Save menu, refer to 4.3)

4.1) Memory Segment Menu (MEM SEG)

Segment number and trigger time are displayed in a table to select the memory segment.

4.2) System Menu (SYS MENU)

• ID	ID number settings, 0 ~127
• DATETIME	Date and time settings, year, month, day, hour, minute, second
• OSD DISP	Video OSD display settings, OFF, FRAME, ALL
• OSD MODE	Video OSD display settings by Camera mode, OFF, FRAME, ALL
• OSD TIME	Trigger clock setting, TRIG , CRNT
• CAFM DIS	Video image center mark settings, OFF , WHT, BLK
• FRM DISP	Frame number display settings, frame number (FRAME), time elapsed from trigger input (TIME), absolute time (ABS.TIME), memory%
• FRM TIME	Frame time standard settings, trigger (TRIGGER), exposure center (EXPOSURE)
• TIMESTAMP	Frame time standard settings, OFF , ON
• EXP TIME	Exposure time settings GX native Internal standard time = Start exposure K3 compat Internal standard time= End exposure K4 compat Internal standard time= End exposure (K4/K5)
• SYNC TIME	Synchronized time selection, ASYNC (internal camera), GX-HUB, IRIG
• SYNC SEL	Synchronized signal selection, INT (internal camera), EST2
• EST VIEW	EST VIEW 時の EST 信号同期設定、OFF(internal camera), ON While in the EST View, the EST signal synchronism settings While in the EST View, the EST signal synchronized settings
• VIDEOOUT	Video output settings, OFF, ON
• ZOOM	Zoom settings, FIT1 , FIT2, 1/2, x1, x2, x4
• SCROLL	XY coordinate settings and display 0 0 (center of the screen) set using arrows. Trigger button targets the center of the screen.
• BEEP	Remote control BEEP sound settings, OFF, ON
• AUTOVIEW	After recording has been completed, automatically sets to the view mode then switches the memory segment with the next ARM command. OFF , AUTO, LOOP. AUTO stop when all of the memory segments have been saved, and overwriting is only performed in LOOP. Only the STOP command stops LOOP. And also as for REC MODE of a trigger setting menu, in one case of NORMAL, EVENT, BURST, MULTI (A), and MULTI (C), this function can be used.
• WARNING	Warning settings menu
/ BATTERY	Low battery warning, OFF , ON
/ RTC BATT	RTC battery warning, OFF , ON
/ FRM RATE	Abnormal recording speed warning, OFF , ON
/ IRQ	Monitor abnormal camera interruption, OFF , ON
/ BLK BAL	Black balance warning, OFF , ON
• TRIG SET	Trigger settings menu
/ TRIG SEL	Trigger signal selection, TRIG1 (Rear panel connector), TRIG2(J3 connector)
/ REC MODE	NORMAL Normal recording NORMAL(A) Normal recording (A) NORMAL(L) Normal recording (L) EVENT Event recording EVENT(A) Event recording (A) EVENT(L) Event recording (L) BURST Burst recording BURST(A) Burst recording (A) BURST(L) Burst recording (L) MULTI(A) Multi trigger recording (All blocks) MULTI(C) Multi trigger recording (continuous)

MULTIS(A)	Multi trigger recording (All blocks)(A)
MULTIS(L)	Multi trigger recording (All blocks)(L)

(A) of MULTI (A) is the abbreviation for ALL by the above.

The other (A) is the abbreviation for AUTO, it changes a segment automatically, does all the segment records, and is completed.

(L) is the abbreviation for LOOP, I automatic-segment-switch the other (A), and it overwrites a memory segment continuously. Only the STOP command stops LOOP. (C) is an abbreviation of CONTINUATION.

Priority is given to NORMAL (A/L), EVENT (A/L), BURST (A/L), and MULTIS (A/L) over an AUTO VIEW function.

/ BLOCKS	Multi trigger block settings, 1~16
· SIG SET	Input/output signal settings menu
/ TRIG1	TRIG1 trigger input polarity settings, POSI(rising), NEGA (falling edge)
/ TRIG2	J3 trigger input polarity settings, CRNTON (current ON), CRNTOFF(current OFF)
/ EST2	J3 EST2 input polarity settings, POSI (rising), NEGA (falling edge)
/ EPO	J3 EPO output polarity settings, POSI (exposing during H), NEGA (exposing during L)
/TRIGFLT	Trigger filter settings, 200.0 , 0.0~6553.5 (in usec)
/EST FLT	EST filter settings, 0.0 ~6553.5 (in usec)
· SYS SET	System settings menu
/ SEG SIZE	Memory segment settings, 1 ~8 (2GB MODEL), 1 ~16(4GB MODEL)
/ REBOOT	Reboot with network settings
· INFO	Information display menu
/ MODEL	Display model name
/ VERSION	Display camera software version (firmware)
/ CID	Display camera ID number
/ MEM SIZE	Display memory capacity
/ REVISION	Display camera hardware revision
/ NETWORK	Display network
/ IP ADDR	Display IP address, sub net mask
/ MAC ADDR	Display MAC address
/ ELAPSED	Display total elapsed time

4.3) Save Menu (SAVE MENU)

· MCFF	Save in MCFF format, Show saved file name after saved
· FREE FRM	Frames available for saving display
· SAVE FRM	Display and settings for range saved to USB external media
· REC FRM	Recording frame range display
· YC TIFF	Save still image with VGA resolution being displayed in YC TIFF format, Show saved file name after saved
· SAVE SET	Save settings menu
/ RETRY	Compare data and if there is a discrepancy, retry OFF , ON
/ ERASE	Black data erase, OFF , ON
/ ERROR	Operation settings when error detected, ABORT , CONTINUE

5) Direct Data Save Mode

Access this menu with the direct "DOWNLOAD" button while in the STOP mode. Press "SET" to start saving, and press "SET" when save is completed to return to the STOP mode.

- MODE Display mode
- START Display start frame
- END Display end frame
- SAVE Press "SET" to start saving
- FILE Display file name
- Bar display Toolbar to save data, display progress of save

6) System Setup Menu (SYSTEM SETUP MENU)

Perform system settings. While in the STOP mode, access this menu by pressing "STOP"+"TRIG"+"SET" simultaneously

- IP ADDR Network settings, IP address, sub net mask settings
(At shipment there is a nac private address ClassB set. Do not connect directly to the internet.)
- MAC ADDR Display MAC address
- RESET Reset function, returns to factory settings for that shown in **bold**.
- VIDEO Video output method settings, **NTSC**, PAL
- REBOOT Reboot system

7.4.4 Memory Backup

After recording has been completed, protects the contents of the recorded image when the power switch has been turned off or the power cord has been disconnected. When power is turned on, it returns to the identical state immediately after recording.

- 1) Battery
 - Type Nickel cadmium: 3x4
 - Nominal Capacity 600 mAh
 - Nominal Voltage 4.8V
 - Life 1 year

The batteries are not rechargeable. The life of the batteries may vary dramatically depending on the ambient temperature and conditions of use. It is possible to use batteries past their shelf life but there is a possibility they may not meet specifications and so should be replaced annually.

- 2) Backup Time 2 hour

- 3) Backup Start Conditions

After recording has been completed, if the DC input voltage to the MEMRECAM main unit is 19.0V or less.

- 4) Charging

Time Approximately 10 hours(from completely dead battery to full charge)
Start Conditions With an external power source for the DC input connector of this unit.

Note) Since it is designed to reduce deterioration due an overcharged battery, it is possible to extend the life of the battery by avoiding continuous charging for three days or more.

- 5) Battery Status Display

The battery status is shown by the color of the MB LED on the rear panel of the camera.

5.1) Color Shown

Color Shown	Charge Remaining
Red	Low
Orange	Medium
Green	High

Since there are differences in batteries and the ambient temperature, the display is not precise. Use as directed. If the color of the flashing LED changes from orange to red while backing up, charge as soon as possible (connect the external power source to the DC input connector of the camera). Otherwise, the excessive discharge protective function is activated and the images in the memory are lost.

5.2) Display Lit, Flashing

Lit · Flashing	Backup Status
Lit	Backing up with an external power source
Flashing	Backing up with the battery
Not lit	Backup OFF

If valid image data is not saved in the memory, the backup does not start.

5.3) Replacing Batteries

With normal use (charge and discharge several times per day at normal temperatures), the life is about one year but the life can vary depending on storage temperatures, the number of charges and the time of continuous charging.

During actual use, the time for the color of the flashing LED to turn red may be shortened in spite of an adequate charge, which may impact the use.

Avoid using or storing in locations of high temperatures will extend the life of the battery.

Using nickel cadmium batteries improves the efficiency of the memory when the battery is completely discharged, and thus extends the life of the battery.

Remove the cover of the main unit of the camera to replace the battery.

7.5 Input/Output Connector

7.5.1 Input Power

Name	DC IN
Connector name	LEMO EGG.1B.303
Plug name	LEMO FGG.1B.303
Power voltage	DC20-32V
Input power	DC power (AC adapter etc.)
Power consumption	Approximately 39WARM mode, DC24V, when not connected to a peripheral device)
Power protection	
Reverse polarity	internal fuse (can't be replaced by user)
Excess charge	35VDC, 1 minute

With remote power control function (Refer to 【7.5.6】)

7.5.2 RS232

Name	J-PAD
Connector name	LEMO EGG.0B.306
Plug name	LEMO FGG/0B.306
Standard	RS-232C Standard, no insulation, but only with TXD and RXD
Function	For JPAD3(remote controller) connection

7.5.3 Trigger input

Name	TRIG 1
Connector name	HIROSE BNC-FBR(41)
Plug name	BNC plug connector
Signal level	TTL level, 5V pull up resistance 4700Ω, insulation L level:- 0.5VDC (minimum applied voltage) ~0.8VDC H level:2VDC~5.5VDC(maximum applied voltage)
Function	Trigger valid H→L. Contact input available. Polarity reversal function

Refer to APPENDIX A for details.

7.5.4 DC24V Output, VIDEO output

Name	VF
Connector name	HIROSE HR10A-7R-6S(73)
Plug name	HIROSE HR10A-7P
(1) DC24V OUTPUT	
Signal level	Power input through output No protective circuit, maximum output current:1A
(2)VIDEO OUTPUT	
Method	NTSC/PAL
Signal level	1V(p-p), 75Ω, no insulation

7.5.5 USB

Name	USB
Connector name	L-COM ECF504-5M (USB Type A HOST)
Standard	USB2.0 Standard, insulation

7.5.6 J3 Connector

- 1) Connector

ID color	Blue
Name	REMOTE
Connector name	LEMO EGG.2B.318
Plug name	LEMO FGG.2B.318

- 2) Internet

Standard	1000BASE-T(IEEE 802.3 ab), 100BASE-TX(IEEE 802.3 u), 10BASE-T(IEEE 802.3) insulation
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- 3) EST2 / EVENT Input

Signal level	TTL level, 5V pull up resistance 4700Ω, insulation L level:- 0.5VDC (minimum applied voltage) ~0.8VDC H level:2VDC~5.5VDC (maximum applied voltage)
Function	With EST input, exposure starts H→L photographs one image Reverse polarity function. Synchronization delay 1.5μsec or less During EVENT input, the signal level is saved along with the image.

Refer to APPENDIX B for details.

- 4) IRIG-B Input

Signal level	3 V(p-p)(1~10 V(p-p)), high impedance, insulation
Standard	IRIG Standard 200-98

Refer to APPENDIX E for details.

- 5) TRIG2 Trigger Input

Signal level	Current loop with photo coupler, insulation Current limiter resistance 1500Ω, maximum applied voltage ±32V
Function	Trigger valid at 5V or more. Reverse polarity function.

Refer to APPENDIX A for details.

- 6) EPO Output

Signal level	TTL level, insulation. Reverse polarity function.
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Refer to APPENDIX C for details.

- 7) Power Control

Signal level	TTL level, 5V pull up resistance 4700Ω, insulation L level:- 0.5VDC (minimum applied voltage) ~0.8VDC H level:2VDC~5.5VDC (maximum applied voltage)
Function	Power ON with H, power OFF with L. No reverse polarity function.

Refer to APPENDIX D for details.

7.5.3 Pin Numbers

- 1) Power input (DC IN)

1	DC24V IN
2	FRAME GND
3	DC24V IN RTN
shell	FRAME GND

- 2) RS232 (J-PAD3)

1	NC
2	DC24V OUT (REMOCON power)
3	DC24V OUT TRN
4	TXD OUT(REMOCON RS-232C)
5	RXD IN(REMOCON RS-232C)
6	NC(REMOCON SIG GND)
shell	FRAME GND

- 3) Triger input (TRIG 1)

1	TRIG1 IN
2	GND (TRIG1 IN RTN)

- 4) DC24V Output, VIDEOOutput (VF)

1	VIDEO OUT RTN
2	VIDEO OUT(NTSC/PAL signal)
3	DC24V OUT(Viewfinderpower)
4	DC24V OUT RTN
5	NC
6	NC
shell	FRAME GND

- 5) USB

1	USB2.0 HS VBUS
2	USB2.0 HS D-
3	USB2.0 HS D+
4	USB2.0 HS GND
shell	FRAME GND

- 6) J3 Connector (REMOTE)

1	MDI 0+ 10/100/1000BASE-T Interface
2	MDI 0- 10/100/1000BASE-T Interface
3	MDI 1+ 10/100/1000BASE-T Interface
4	MDI 1- 10/100/1000BASE-T Interface
5	MDI 2+ 10/100/1000BASE-T Interface
6	MDI 2- 10/100/1000BASE-T Interface
7	MDI 3+ 10/100/1000BASE-T Interface
8	MDI 3- 10/100/1000BASE-T Interface
9	EST2/EVENT IN
10	EST2/EVENT IN RTN
11	IRIG-B IN
12	IRIG-B IN RTN
13	TRIG2 IN A (anode)
14	TRIG2 IN C (cathode)
15	EPO
16	EPO RTN
17	POWER CONT IN
18	POWER CONT RTN
shell	FRAME GND

7.6 Environment

- 1) Operating temperature and humidity 0~40°C, 30~80%RH (no condensation)
- 2) Storage temperature and humidity -10~60°C, 20~80%RH (no condensation)

7.7 Shape

- 1) Exterior dimensions Approximately W100 x H110x D260mm (excluding connector, protruding parts, options, F-mount and tripod plate)
- 2) Weight 2GB/4GB Model: Approximately 4 kg (excluding cables and options)
- 3) Tripod mounting screw 3/8-16UNC (large screw) DEPTH8mm
1/4-20UNC (small screw) DRPTH8mm
- 4) G-resistant mounting screw M6, DEPTH8mm, 4 screws

7.8 Adaptive Standards

- 1) Safety standard EN60950
- 2) Electromagnetic compatibility EN55022
EN55024
FCC Part 15 Class A

7.9 Accuracy

- 1) Recording time accuracy $\pm 0.01\%$ (or 10^{-4}) or less
The inverse of the recording speed (frequency) during a given time (1 sec or more) is used as the time accuracy.
- 2) Method of determining recording time accuracy
The EPO signal output from the J3 connector measures the frequency with the frequency counter for the recording speed during a given time (1 sec or more).

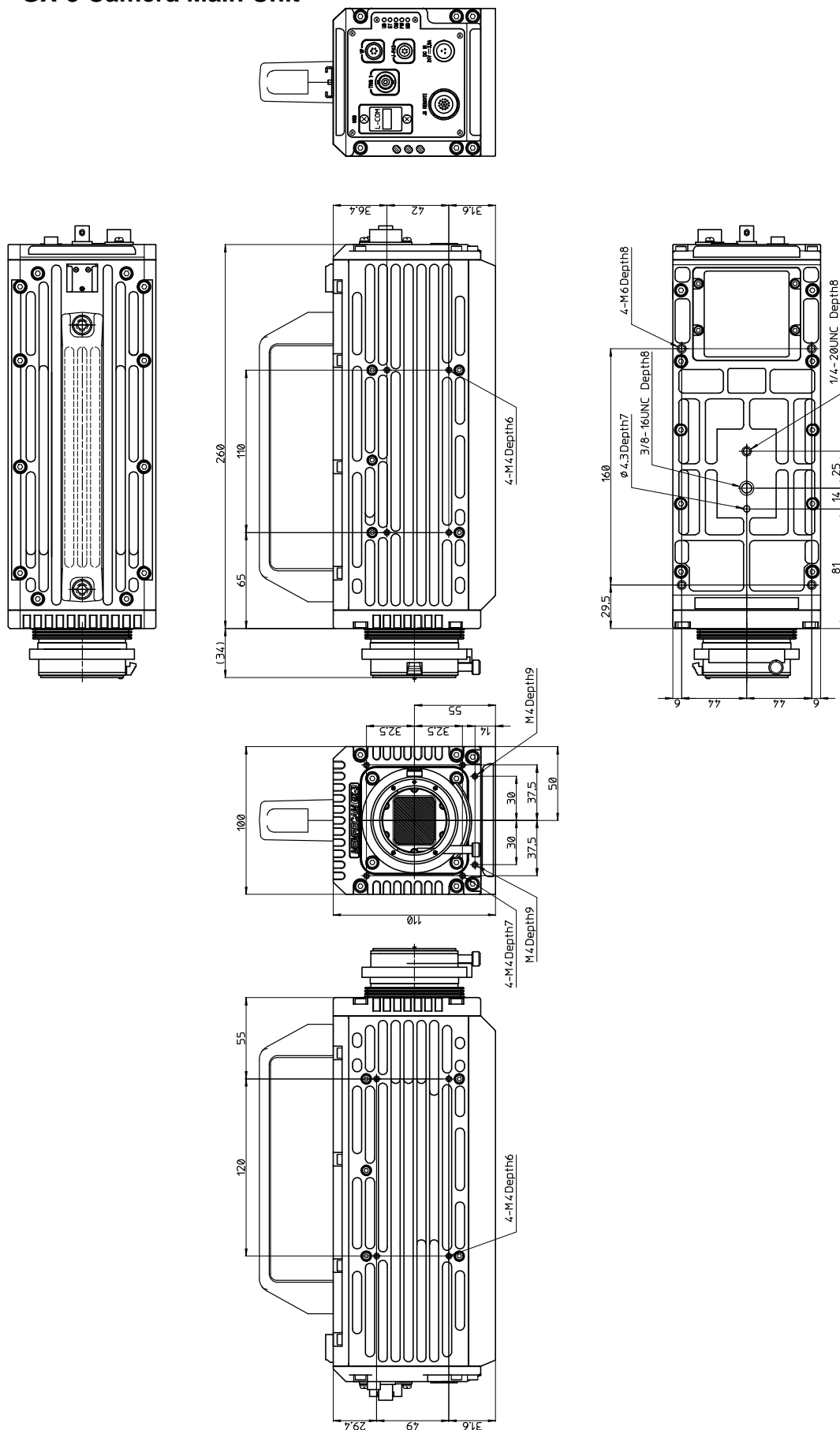
7.10 Replaceable Parts

Replaceable parts are not covered by the warranty.

- 1) Memory Backup Batteries Refer to 【7.4.4】
- 2) Clock Batteries Clock batteries are used in the camera. These batteries last approximately 8 years. Since the time will not be correct when the batteries fail, it will be necessary to reset the time each time the power is turned ON. Since the clock batteries are soldered, the camera must be returned to the factory for replacement.

7.11 Exterior Diagram

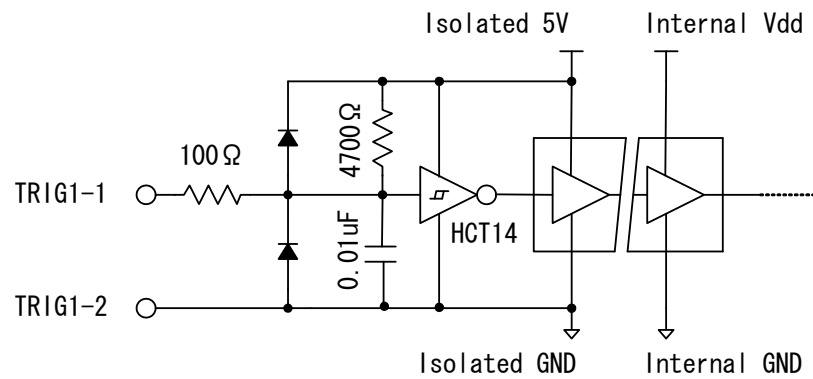
7.11.1 GX-3 Camera Main Unit



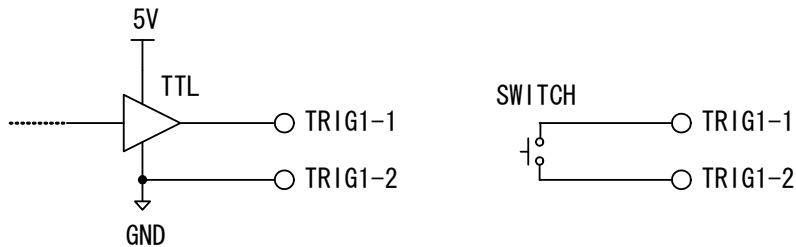
APPENDIX A Trigger

A1. TRIG1

·Equivalent Circuit Diagram for Input



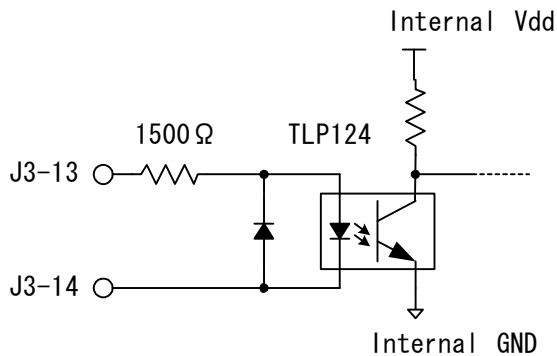
·Recommendation interface circuit



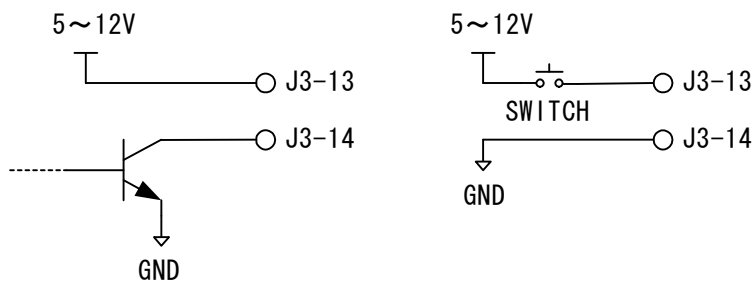
A2. TRIG2

·Equivalent Circuit Diagram for Input

Reference Value: The input pulse width must be approximately 10μsec or more with CRNTON, and approximately 350μsec or more with CRNTOFF.



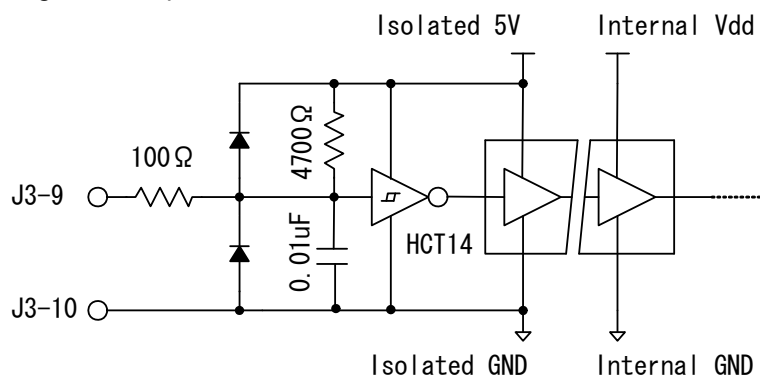
·Recommendation interface circuit



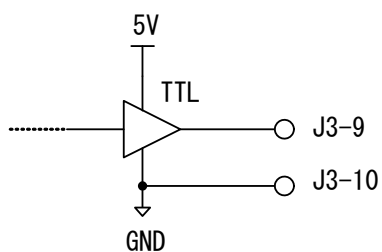
APPENDIX B Exposure Start Signal (EST) and Event Signal

B1. EST2 / EVENT

・Equivalent Circuit Diagram for Input

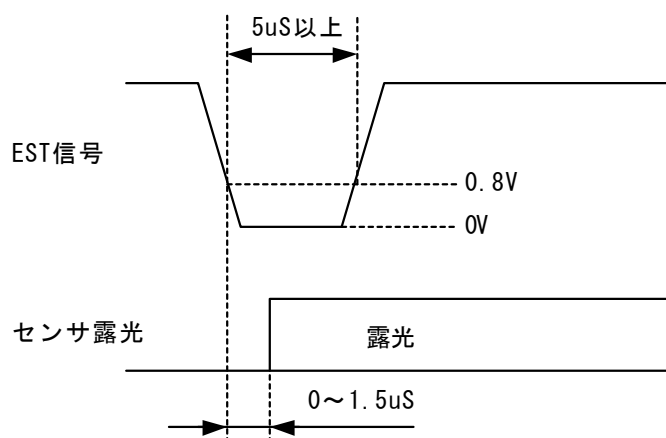


・Recommendation interface circuit



B2. Timing

A timing diagram is shown when the noise filter value is 0μsec.



B3. Timing restrictions

4.2.3) Restrictions of the maximum recording speed of a clause are applied. If this is put in another way

Cycle of an EST signal $> 1/\text{The maximum recording speed}$

The right recording is not made unless it fills the above.

Furthermore, there are restrictions by shutter time.

Cycle of an EST signal $> \text{Shutter exposure time} + 5.84\mu\text{sec}$

The right recording is not made unless it fills the above.

B4. Event Signals

The input signal level (if the J3 connector contact pin level is a valid level) is saved along with the image.

Verify the event signal valid polarity/invalid polarity via video output or the GXLink screen.

There are no limits on the number of event signal input.

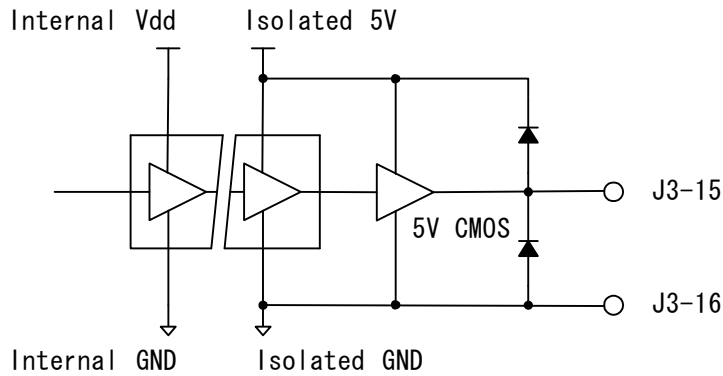
There is no jump function.

This can be used in conjunction with the event trigger function.

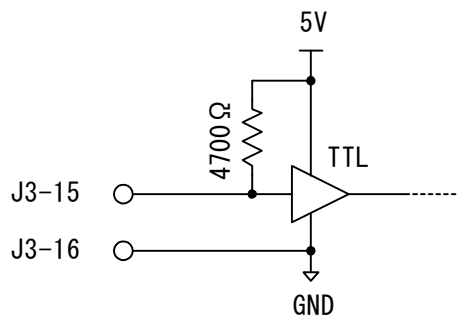
APPENDIX C Exposure Pulse Output (EPO)

C1. EPO

- Equivalent Circuit Diagram for Input

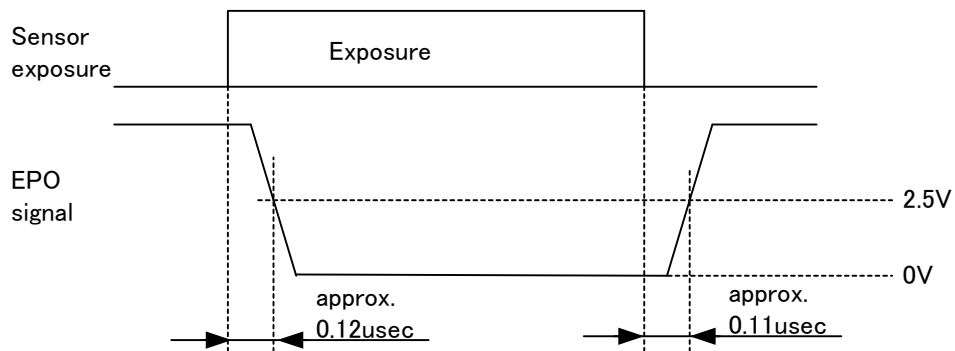


- Recommendation interface circuit (without external noise)



C2. Timing

The EPO signal delay relative to exposure is as follows



The exposure time and the jitter (shift from nearby exposure time) is within $\pm 1.5\mu\text{sec}$.

C3. Simple Synchronized Photography

Simple synchronized photography is possible using the exposure pulse output (EPO) signals with multiple GX series cameras or fx series cameras with the exposure start signal (EST) input function. Also, synchronized photography is possible using cameras with equivalent functions from other companies.

Note) Here, "simple" includes the possibility that the time accuracy is not guaranteed due to signal delays or time shifts, and the restrictions on the same recording speeds for all of the cameras.

Simple synchronized photography is comprised of a system determined by master / slave cameras. There is one master camera among all of the cameras used, and the rest are slave cameras. If the GX series camera is the master camera, the exposure pulse output (EPO) for this camera is connected to the exposure start signal (EST) input for all of the other cameras.

If combining the GX series and the fx series, since the fx series EST input specifications only allow exposure to start with H→L edge signals, reverse output polarity is set on the master GX series camera so the L level is output during exposure. Also, the EST input setting for the slave GX series camera is H→L edge signals for the start of exposure.

If combining with cameras from other companies, refer to the manual to coordinate the signal polarity.

C4. Precautions

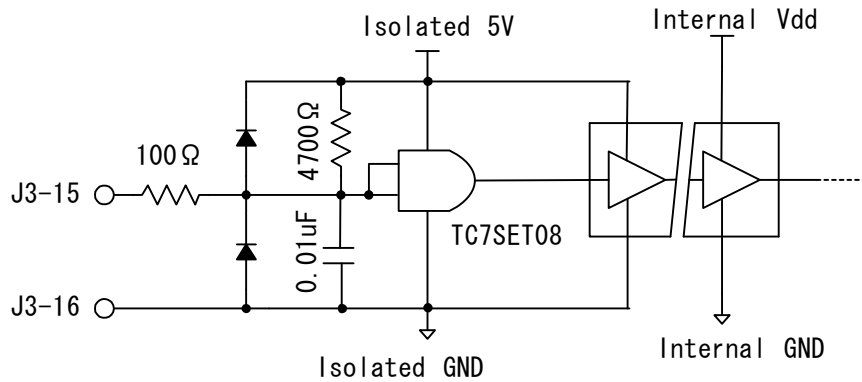
Since the exposure pulse output (EPO) signals are identical to the exposure time (shutter speed), the pulse widths are narrowed when a short exposure time is set. Precaution is necessary for signal transmission conversion to the proper interface and for the cable properties.

An incorrect pulse may be detected with the wrong method of use, and transmission may not be possible due to the elimination of pulses.

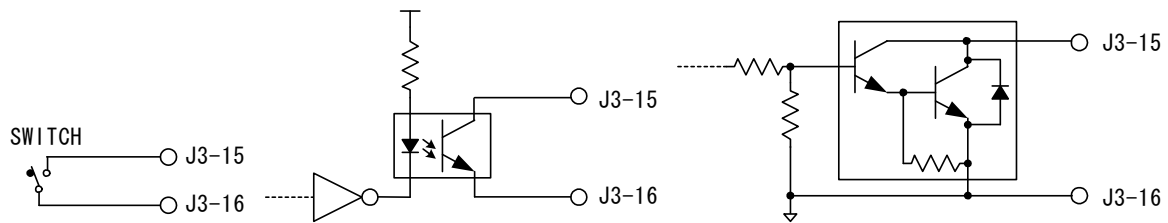
APPENDIX D Discrete Interface

Power control input

•Equivalent Circuit Diagram for Input



•Equivalent Circuit Diagram for Input



•Example of Method Used

The power is ON during the open state, or the H level, and if there is a short between two pins or at the L level, the power is OFF.

This signal designed for power control in the GX-HUB system.

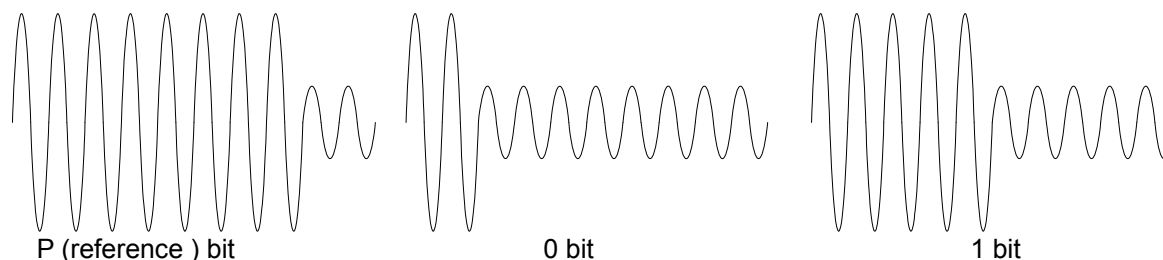
APPENDIX E IRIG-B

E1. Standard:IRIG Standard 200-98, IEEE1344

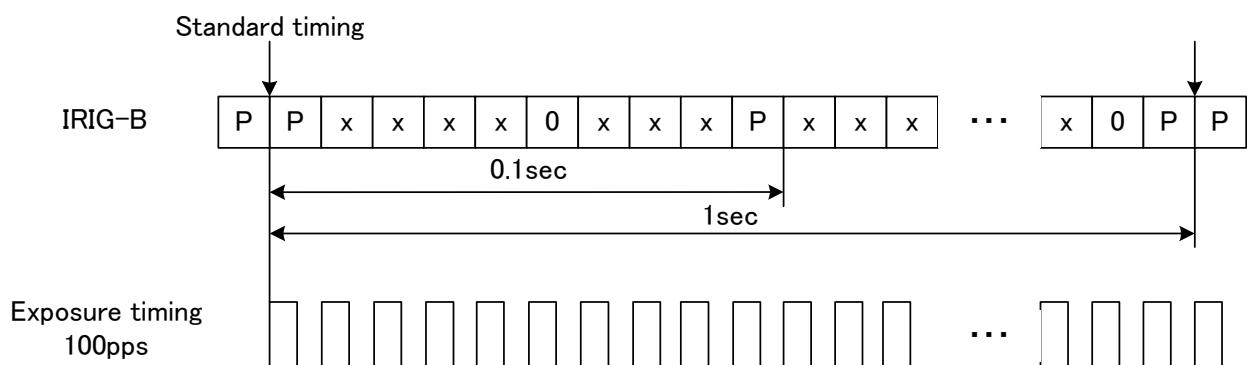
Compatible with 1kHz carrier modulation IRIG-B (B120, B122, B123 format).
Not compatible with unmodulated IRIG-B (B000, B003 format).

E2. Modulated IRIG-B Waveform and Exposure Time

Modulation in the following diagram is for P bit , 0 bit and 1 bit. The standard time is the top portion. There are 100 bits per second and 10 carriers per 1 bit. There are P bits for each 0.1 sec. 1 carrier is 1msec.



The example in the figure below shows the IRIG-B and the exposure time for 100 pps.
The figure below shows "x" as 1 or 0 bit.



At any photographic speed, the IRIG-B and exposure start must have the same standard time (with an exposure phase shift setting of 0°).

E3. Exposure Phase Shift Function

Uses as a method to implement higher resolution and high speed recording when using multiple cameras. Depending on the camera placement, it may be possible to ignore the parallax during infinite telescopic photography. The settings are in phase angle degrees (units 0~359).
Exposure phase shift settings can only be set with the camera control software.

Example)

At 1024 x 1024 pixels, each camera is set to 2,000 frames/sec, and four cameras are subject to IRIG synchronization. With the respective phase shift for each camera set to 0°, 90°, 180°, and 270°, photography can be conducted at 2,000 x 4=6,000 pps.
2,000 frames/sec involves a frame interval of 500µsec so each camera shifts only 0µsec, 125µsec, 250µsec, and 375µsec from the IRIG-B standard time.

Note) With standard multiple synchronized camera systems (such as GX-HUB system), the exposure time for all of the cameras is synchronized so the phase shift should be set to 0°.

APPENDIX F AUTO PILOT

GX camera has a function (auto pilot) that executes the processing specified automatically after turning on the power supply.

(A part of the firmware version doesn't correspond to auto pilot.)

The USB compatible storage media that copied the sequence file (SEQUENCE.DAT) is connected with the GX camera while turning off the power supply in order to execute the GX camera automatically and turned on the power supply.

Sequence file (SEQUENCE.DAT) is made with the auto pilot sequence making tool.

Note) Auto pilot function can be set by only GXLink. Refer to **【GXLink User's Manual】** for the setting method.

8

Options

8.1 Specifications of the Main Options

8.1.1 AC Adapter

- 1) Input AC100~240V, 47~63Hz
Connector:AC 3 pin connector
- 2) Output DC24V, 4.5A (max), at this point, the efficiency is at least 75%
Connector:LEMO FGG.1B.303
- 3) Operating temperature and humidity 0~+60°C, 5~95%RH, no condensation
- 4) Storage temperature and humidity -40~+85°C, 5~95%RH, no condensation
- 5) Exterior dimensions Approximately W127 x H72 x D255 mm (not including connector)
- 6) Weight Approximately 550g
- 7) Power switch with guard



Ground the AC 3 pin connector. If not , electrical shock may occur when the camera or GX-HUB is touched.

Warning

8.1.2 J-PAD3

- 1) Power Supplied from the camera
- 2) Operating temperature and humidity 0~+40°C, 20~80%RH, no condensation
- 3) Storage temperature and humidity -10~+60°C, 20~80%RH, no condensation
- 4) Exterior dimensions Approximately W65 x H140 x D18 mm (excluding connector)
- 5) Weight Approximately 200g
- Connector Plug:LEMO FGG.0B.306
- 6) Cable Pigtail, length approximately 2.9m
- 7) Transmission RS-232C, 38400 bps
- 8) Operation part Operation button, dial, lock switch, LED display
- 9) LCD display 128 x 64dot, monochrome, back light

8.1.3 Simplified Cables

- 1) Simplified J3 Cable

P3	Camera plug	(ID color:blue)	LEMO FGG.2B.318
P31	ETHER	ETHERNET	RJ45 plug

8.1.4 Branch I/O Cables

- 1) J3 Branch Cable

P3	Camera Plug	(ID color:blue)	LEMO FGG.2B.318
P31	ETHER	ETHERNET	RJ45 receptacle
P32	EST2	EST2 input	BNC plug
P33	IRIG-B	IRIG-B input	BNC plug
P34	TRIG2	Trigger2 input	BNC plug
P35	EPO	Exposure pulse output	BNC plug
P36	PWRCNT	Power control input	BNC plug

8.1.5 5.7 inch LCD Viewfinder

- 1) Power DC24V (20~32V, supplied from the camera), power switch included)
- 2) Maximum power consumption 10W
- 3) Operating temperature and humidity 0~50°C, 20~65%RH(no condensation)
- 4) Storage temperature and humidity -25°C~80°C, 10%~90%RH(no condensation)
- 5) Exterior dimensions Approximately W155 x H117 x D35 mm
- 6) Weight Approximately 600 g
- 7) Video method NTSC / PAL automatic conversion
- 8) LC panel 5.7 inch, TFT,
- 9) Resolution 640 x 480
- 10) Luminance 400 cd/m²
- 11) Angle of view 65 / 65°(left / right), 65 / 40°(top / bottom)
- 12) Connector Power and video supplied from the main camera unit using Hirose HR10A-7R-6P
BNC Loop through Output (automatic terminal)

8.1.6 GX-HUB

- 1) Number of GX camera connections 4
- 2) Power input DC20~32V, power consumption:maximum 12 W,
AC adapter included
- 3) Power switch Yes, GX-HUB and camera link function ON/OFF
- 4) Exterior dimensions Approximately W280 x H75 x D230 mm (not including connector)
- 5) Weight Approximately 4.1 kg (including installation plate)
- 6) Operating temperature and humidity 0~+40°C, 20~80%RH (no condensation)
- 7) Storage temperature and humidity -20~+60°C, 20~80%RH (no condensation)
- 8) Vibration MIL-STD-810C METHOD 514.2 CATEGORY b2 standard
(RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
- 9) Shock half-sine, 11msec, 100G
- 10) Front port
 - Individual input (BNC Connector x 3)
IRIG IN, TRIG IN, EST IN
 - GXSYS (LEMO Connector EGG.2B.318):GX-HUB, or branch input/output using J3 cable
Gbit Ethernet, EPO(4 port OR output), IRIG IN, TRIG IN, EST IN,
POWER CONT
 - FXSYS(MIL Connector ACT90MC35SA):connect with fx series M-HUB
corresponds to fx series camera
 - Priority order is FXSYS > GXSYS > individual input
- 11) Back port GXSYS(LEMO Connector FWG.2B.318) 4 ports
GX series camera J3 Connector or GX-HUB GXSYS and J3 remote
cable connection
- 12) LED display IRIG, TRIG, EST, LINK(Gbit Ethernet), POWER

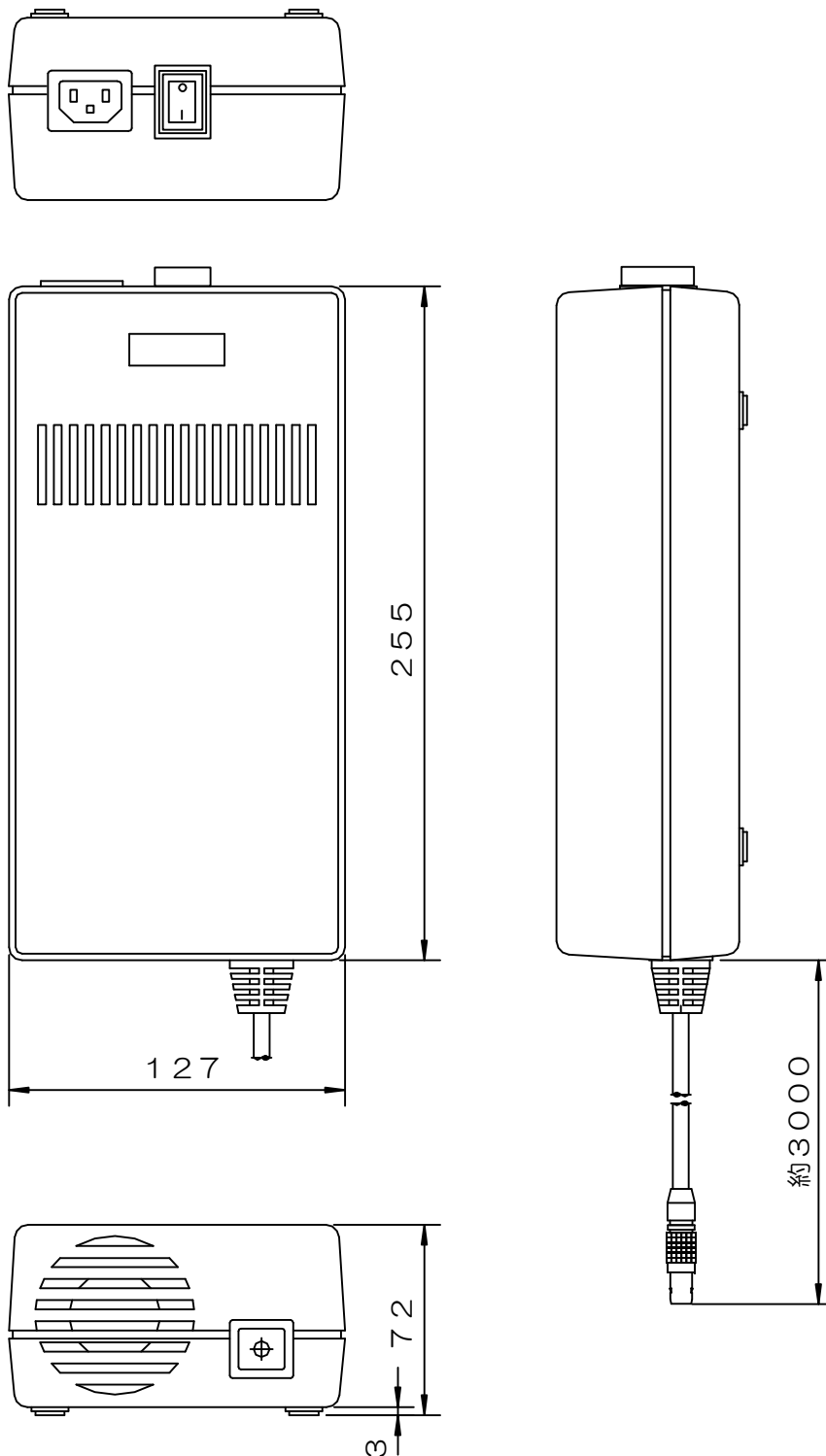
8.1.7 Control Software

- | | |
|-----------------------|---|
| 1) Platform | Windows 2000/XP Professional
Windows XP Professional
Windows Vista Ultimate / Business |
| 2) Compatible cameras | MEMRECAM fx/GX series |
| 3) Function | Camera control (preview, recording, playback, download),
playback image files, image quality adjustment, format conversion,
coordinate measurement, save analog waveform (playback (can
be synchronized with the camera), file output) |
| 4) Input image files | MCFF, CIF, AVI, TIFF, JPG, BMP |
| 5) Output image files | MCFF, AVI, JPG, BMP, TIFF(COLOR 24bit, 48 bit / B/W 8bit, 16bit) |
| 6) Other files | FCV(conversion settings), TXT(scene information),
CSV(analog waves, measurement data) |

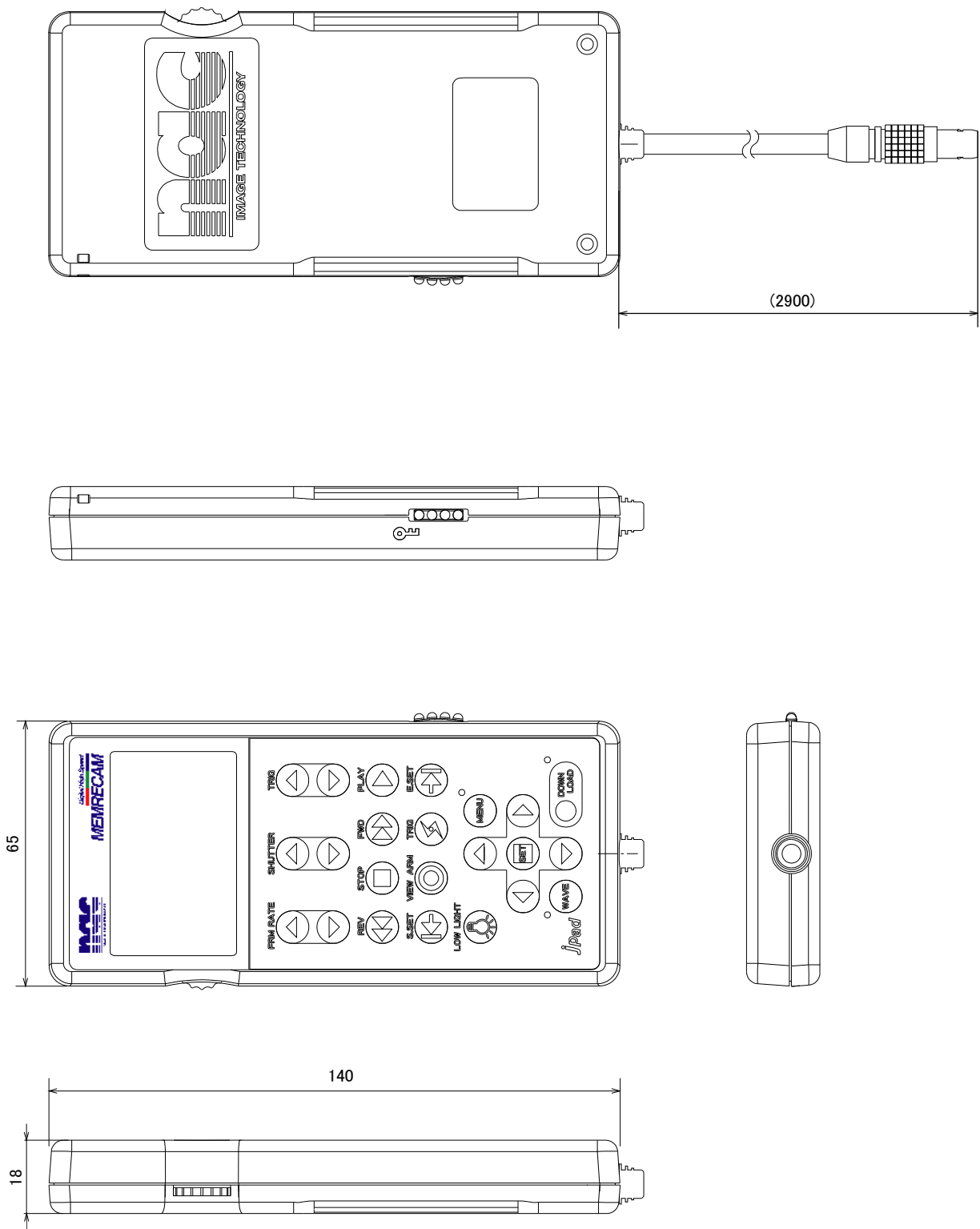
Note) The optional external signal storage unit is required for analog waveforms

8.2 Exterior Diagram

8.2.1 AC Adapter



8.2.2 J-PAD3



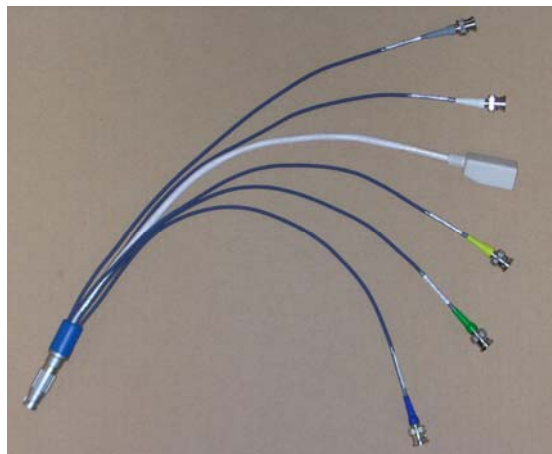
8.2.3 Simplified I/O Cables

Simplified J3 Cable

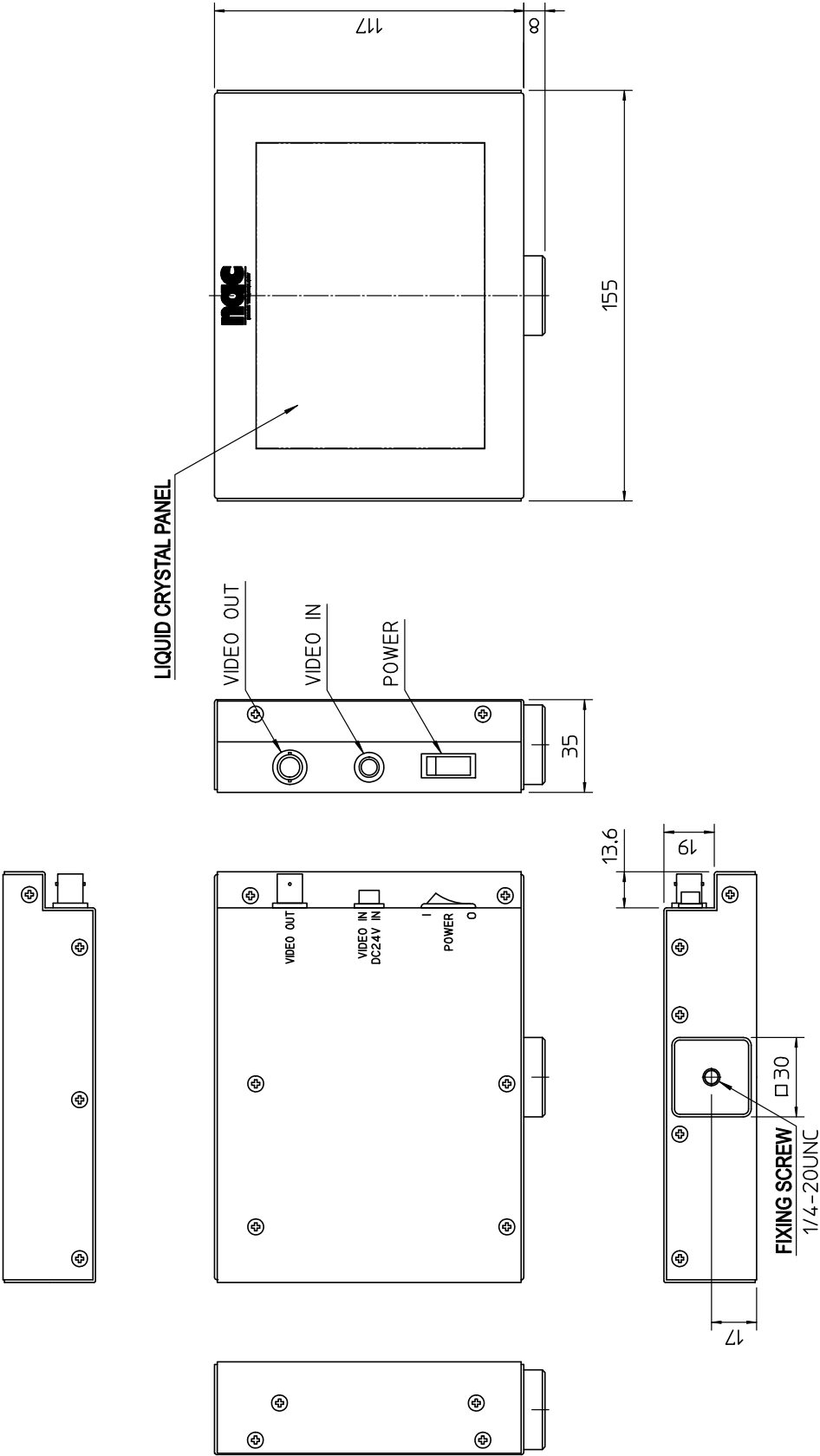


8.2.4 Branch I/O Cables

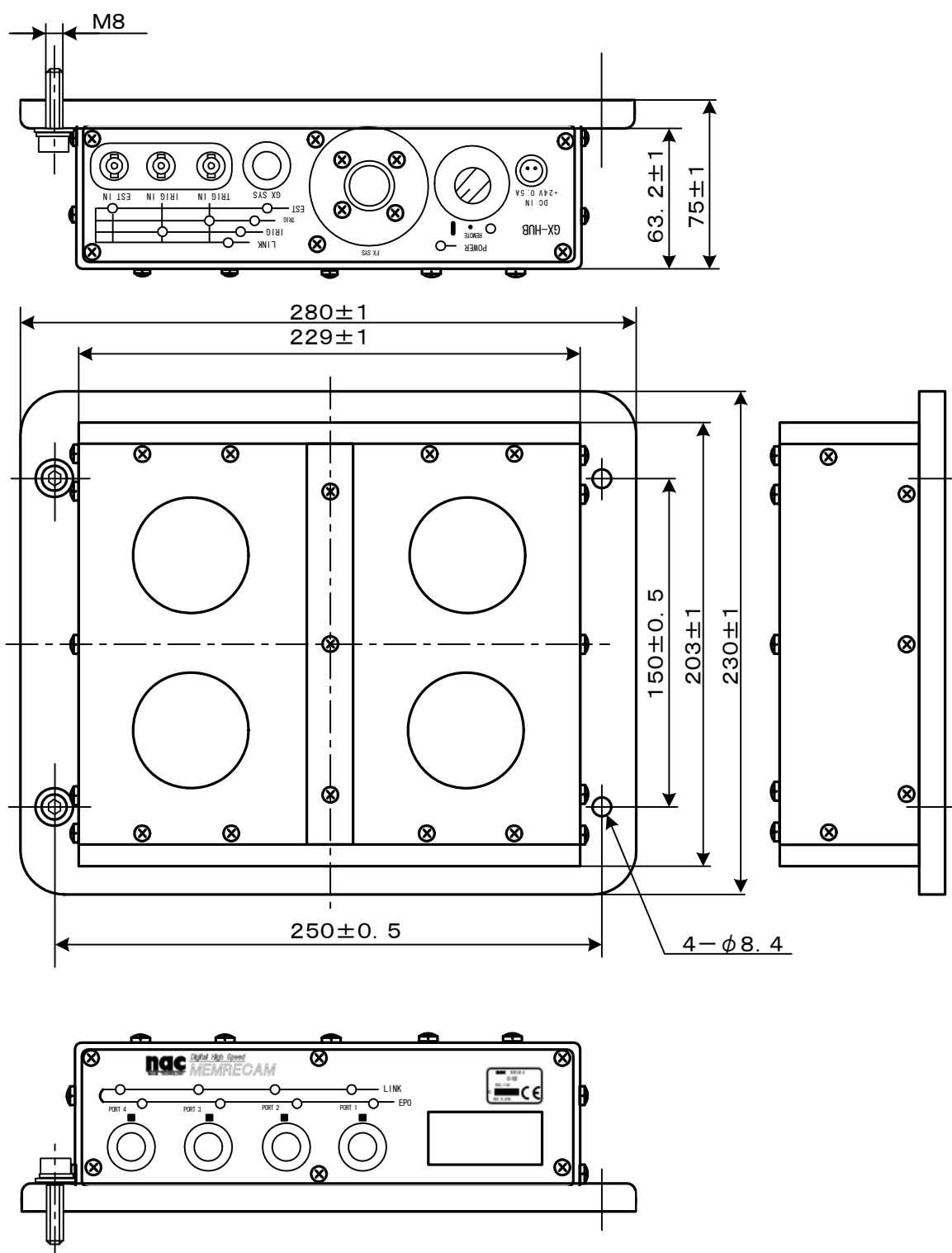
J3 branch cable



8.2.5 5.7 inch LCD Viewfinder



8.2.6 GX-HUB



8.2.7 C-mount Adapter

