

User's Manual

High Speed Digital Camera System

***MEMRECAM GX-1
LTD***

Model ST-751

DECEMBER 2008

nac Image Technology, Inc.

Introduction

The MEMRECAM GX-1 is designed to analyze images moving at speeds not visible to the naked eye.

The MEMRECAM GX-1 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-1 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-1 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 2,000 frames per second. Faster record rates are achievable at reduced resolution. The high speed image files can be transmitted to the control computer using a high speed network (10BASE-T, 100BASE-TX, 1000BASE-T).

The MEMRECAM GX-1 performs high speed photography in demanding test environments, and is compact, durable, vibration and shock resistant, 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-1 with these features.

Trademark

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

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.

Precautions for Use



Caution

Verify Power Input

Power input to the system should be AC 100~240V/47~63Hz when using the AC adapter enclosed, 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

The MEMRECAM GX-1 is a model designed and manufactured to withstand strong vibration and shock, and may be installed in vehicles. However, please take the following precautions.

- The vibration and shock resistant properties are only present in the main camera unit and the optional G resistant lens. There are no vibration and shock resistant properties present in the AC adapter or JPAD3. Please visit your retail outlet to purchase power sources and lenses with vibration and shock resistant properties.
- If connecting a cable to the connector of the main camera unit, all of the connectors will have shock and vibration resistant properties.
- There are six M6 screw openings on the back of the camera for use when installing attachments with vibration and shock resistant properties to the main camera unit.

**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-1 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-1 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-1 **Limited** high speed digital camera system is comprised of the following.

Table 1-1a - MEMRECAM-GX-1 **Limited** - **Standard** Components

Name of Part	Model	Quantity
MEMRECAM GX-1	V-174	1
Tripod plate	4H2172	1
Control software GXLink CD-ROM	584181	1
MEMRECAM GX-1 user's manual	800176	1

Table 1-1a - MEMRECAM-GX-1 **Limited** - **Optional** Components

Name of Part	Model	Quantity
J1 cable	584256	1
J2 cable	584258	1
J2 cable	584258	1
AC adapter	584182-1	1
Carrying case	4H2171	1
JPAD 3 – GX1 Remote Control Unit	584028	1
C Mount Adapter for GX1	4H2204	1
Viewfinder Monitor for GX1	584397	1
MEMRECAM GX Multi Channel Wave Insterter	NCGX-MCWI	1

1.2 MEMRECAM GX-1 Exterior and Functions

The exterior of the MEMRECAM GX-1 is shown below (Figure 1-1, Figure 1-2).



Figure 1-1 The Exterior of the MEMRECAM GX-1 (Lens sold separately)



Figure 1-2 The Exterior of the MEMRECAM GX-1 (Lens sold separately)

1.2.1 Front Panel

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

The F mount adapter is secured to the front panel with four screws. In addition to the optional G resistant F mount lens, a commercially available F mount lens can be used. (excluding some specialty lenses).



When not using the MEMRECAM GX-1, use the mounting cap and do not leave the mounting aperture open. Please use caution to avoid letting dirt and dust inside the mount.

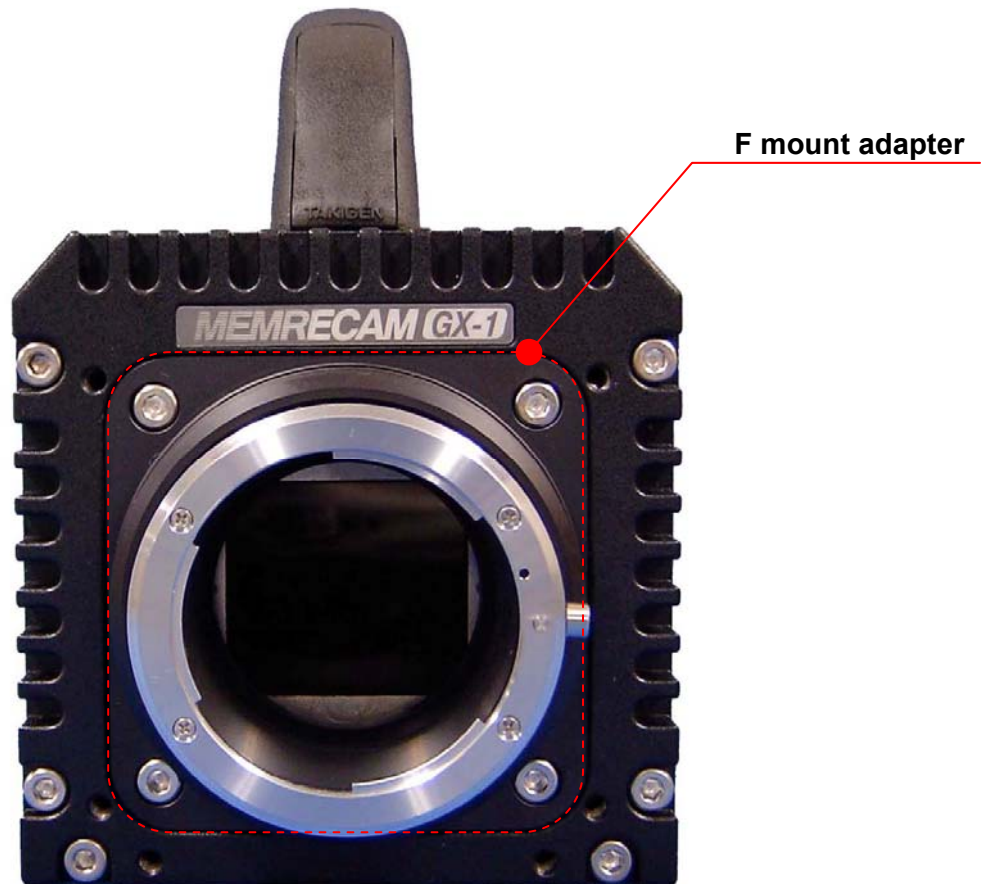


Figure 1-3 MEMRECAM GX-1 (Front Panel)

1.2.2 Rear Panel

The rear panel of the MEMRECAM GX-1 is shown below (Figure 1-4).

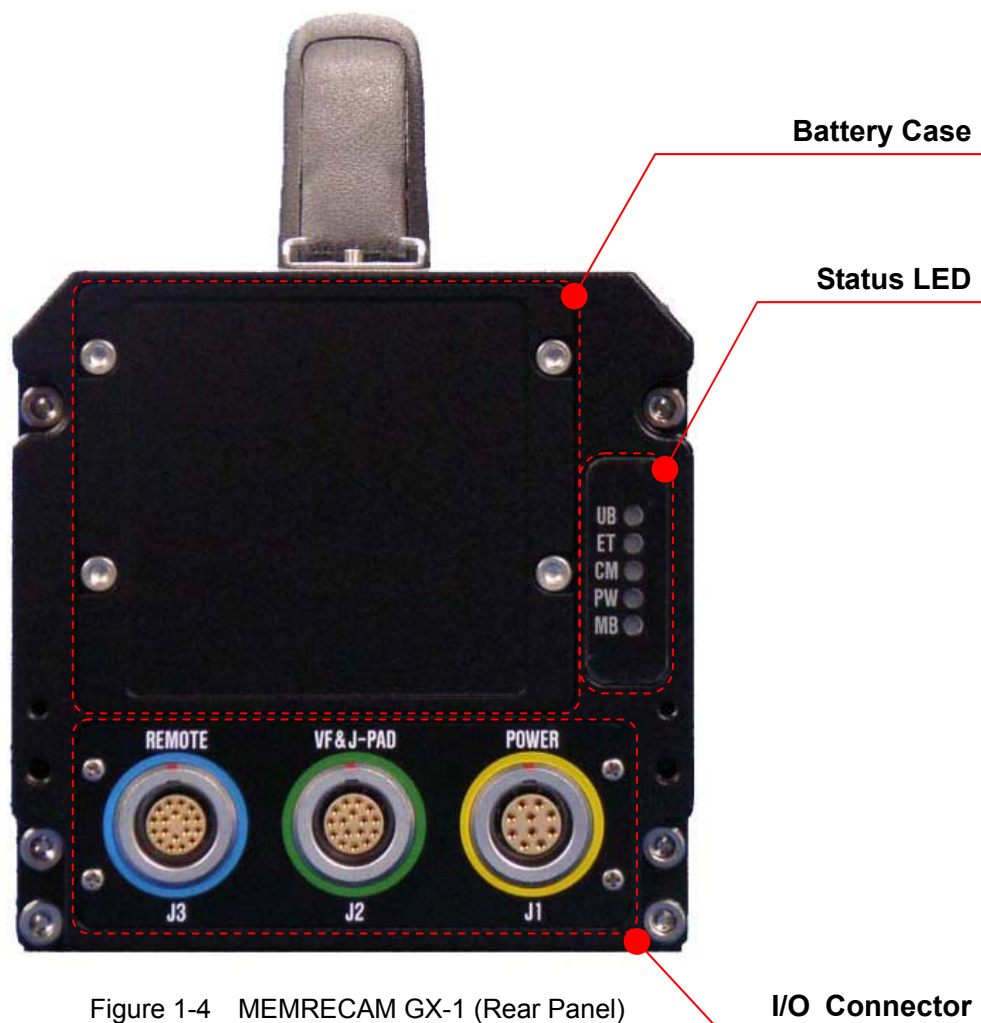


Figure 1-4 MEMRECAM GX-1 (Rear Panel)

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

Connector Name	Branch Name	Input/Output Signal
J1 (POWER) ID color: Yellow	POWER	Power input
	TRIG1	Falling trigger input – Contact Closure / TTL External (TRIG1)
	EST1 (※1)	Signal input to start exposure (EST1)
	ARM-O (※1)	ARM status output
	FAULT (※1)	FAULT status output
J2 (VF&J-PAD) ID color: Green	VF	Video signal output
		DC24V output (VF power)
	JPAD	RS232C (remote control / JPAD3 connection)
		DC24V output (JPAD3 power)
	USB	USB (USB compatible storage media connection)
J3 (REMOTE) ID color: Blue	ARM-I (※2)	ARM command input
	ETHER	Ethernet (control PC connection)
	TRIG2 (※3)	Rising trigger input – Voltage External (TRIG2)
	EST2 (※3)	Signal input to start exposure / event input (EST2)
	IRIG-B (※3)	IRIG-B time code input
	EPO (※3)	Exposure panel output (EPO)
	PWRCNT (※3)	Power control signal input

(※1) J1 branch cable (option) required.

(※2) J2 branch cable (option) required.

(※3) J3 branch cable (option) required.

2) Status LED

There are five status LEDs on the rear panel showing the status of the MEMRECAM GX-1. 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	Color and Flashing Status	MEMRECAM GX-1 Status
UB (USB)	Lit green	Connected to USB compatible storage media
	Not lit	Not connected to USB compatible storage media, or 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 (※1))
	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-1 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 rear panel. Please refer to **【7.4.4 Memory Backup】** for specifications and use of the battery.

1.3 Cables

The cables connected to the input/output connectors on the rear panel are shown below. (Figure 1-5, Figure 1-6, Figure 1-7). Refer to **【1.2.2 1) Input/Output Connectors】** for the input/output signals from the cable branch connectors.

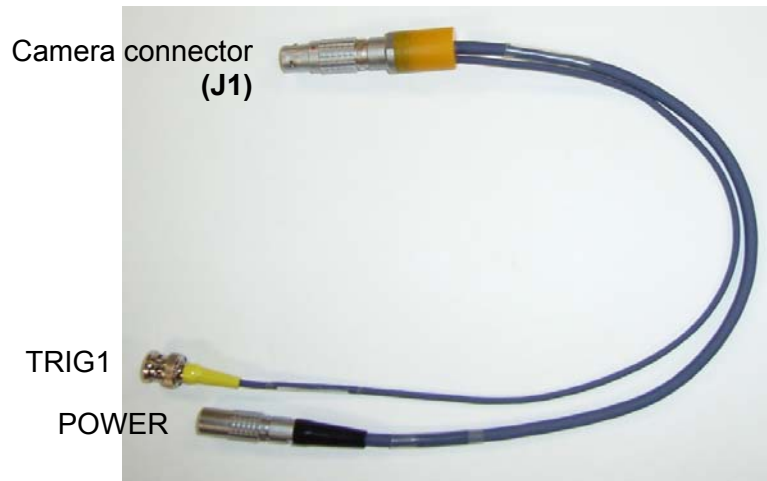


Figure 1-5 J1 Cable

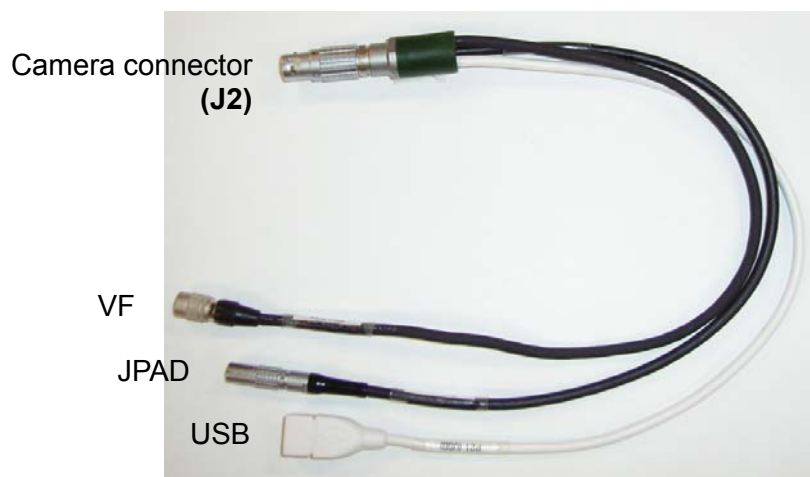


Figure 1-6 J2 Cable

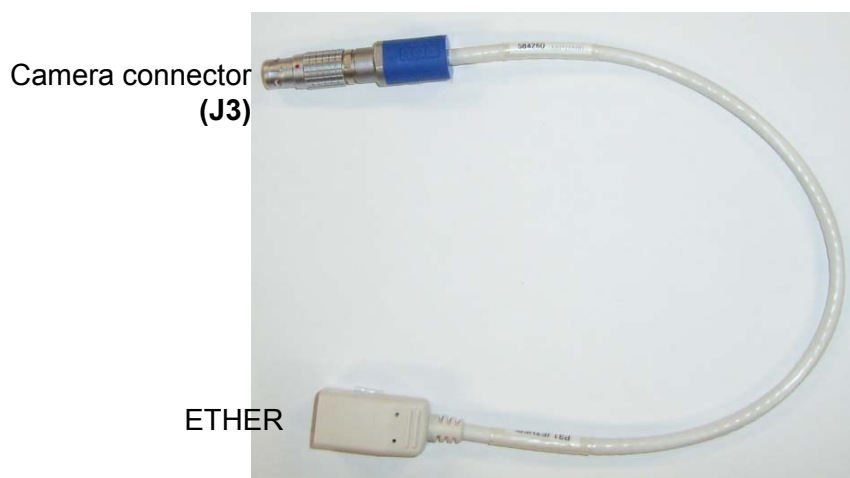


Figure 1-7 J3 Cable

1.4 AC Adapter

The exterior of the AC adapter is shown below (Figure 1-8).

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-1 is performed by the AC adapter power switch.



Figure 1-8 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-1, and so should not be used with other devices.

1.5 GXLink

The control software GXLink is provided on a CD-ROM (Figure 1-9). Please refer to **【GXLink User's Manual】** for GXLink details.



Figure 1-9 Control Software GXLink

2

Basic Operations

2.1 The Flow of Operations

The three methods to operate the MEMRECAM GX-1 are as follows.

- Operation using the remote control JPAD3 (**Optional accessory**)
- Operation using the control software GXLink
- Operation using external input/output signals

This user's manual describes operation using the remote control JPAD3.

The flow of operations for basic recording, playback and storage is shown in Figure 2-1. Settings using the JPAD3 are described in Chapters 3, 4 and 5.

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

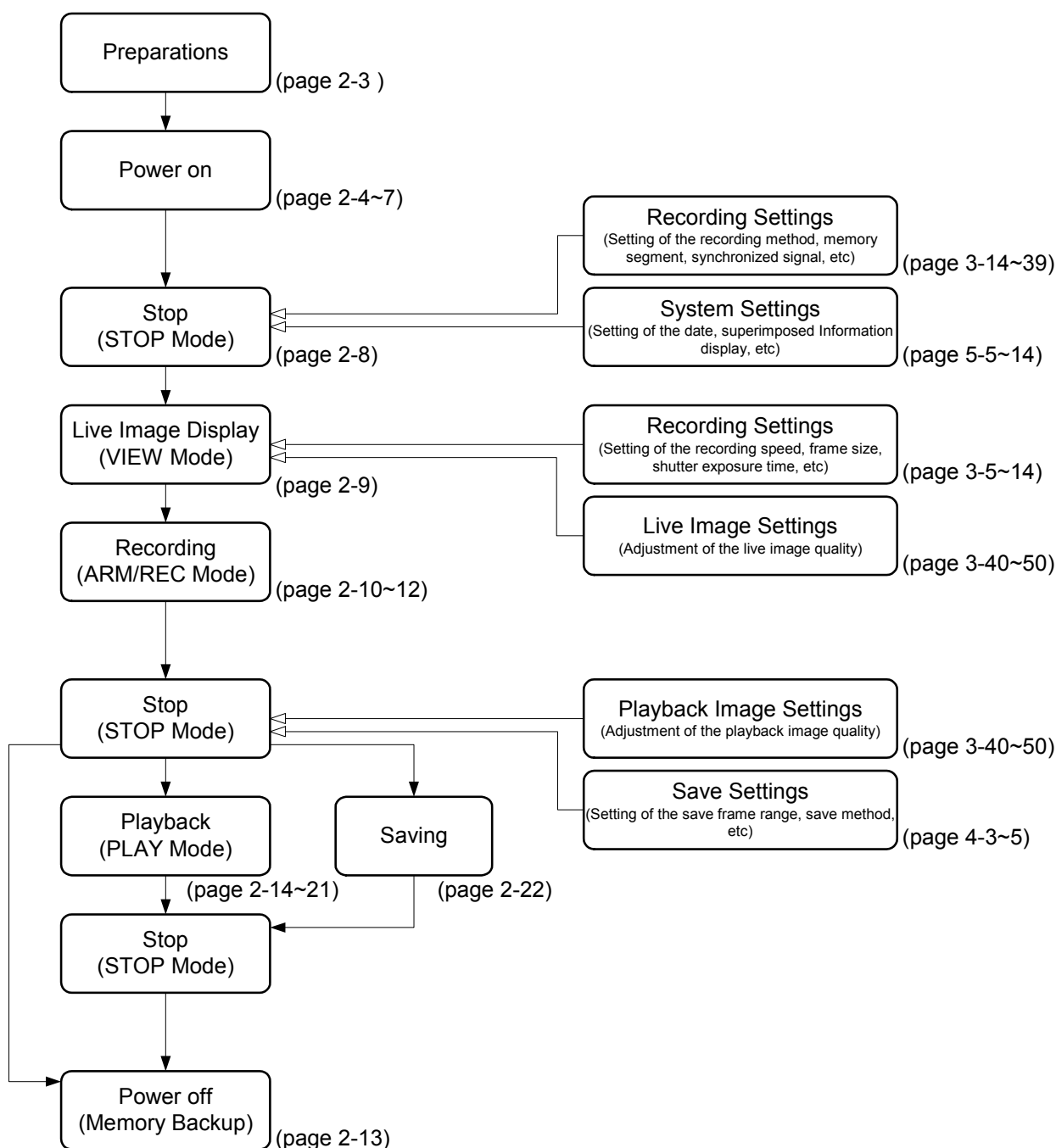


Figure 2-1 The Flow of Operations

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-1	V-174	Standard component
F mount lens		
J1 cable	584256	Optional part
J2 cable	584258	Optional part
J3 cable	584260	Optional part
AC adapter	584182-1	Optional part
Viewfinder	ZO-971	Optional part
Remote control JPAD3	CR1011	Optional part
USB2.0 compatible storage media		
Control PC		Required when using the control software GXLink.

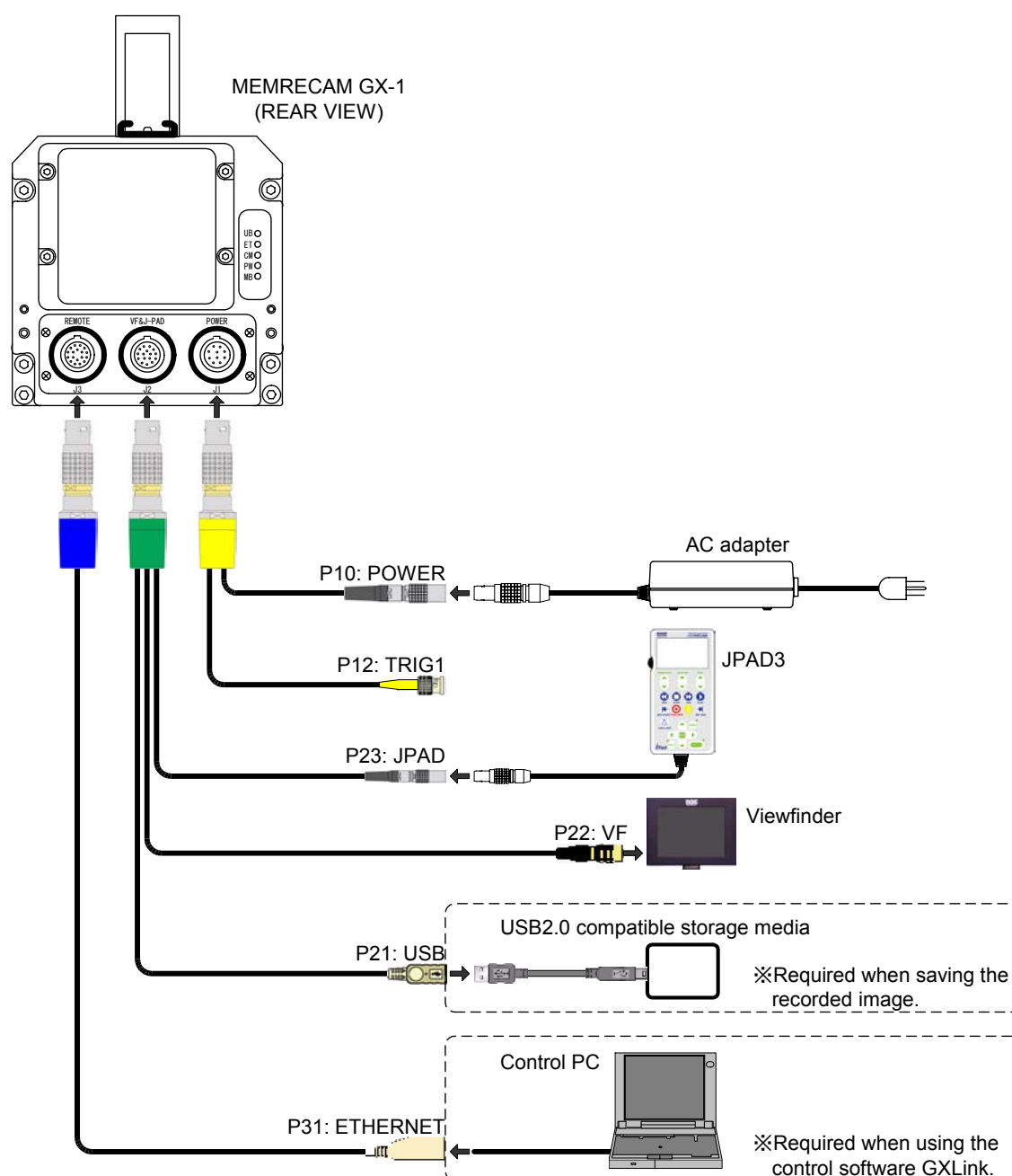


Figure 2-2 Connections for Each Device

2.3 Power

After connecting each device, turn the power on for the MEMRECAM GX-1 by plugging in the AC adapter power switch. There is no power switch for the main MEMRECAM GX-1 unit. Once the MEMRECAM GX-1 starts up, it enters the STOP mode.

2.3.1 MEMRECAM GX-1 Startup

■ Viewfinder Image Display

- 1) Turn on the AC adapter power switch to power the MEMRECAM GX-1.
- 2) Press the viewfinder power switch to display the initial screen (Figure 2-3).



Figure 2-3 Initial Screen

- 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.

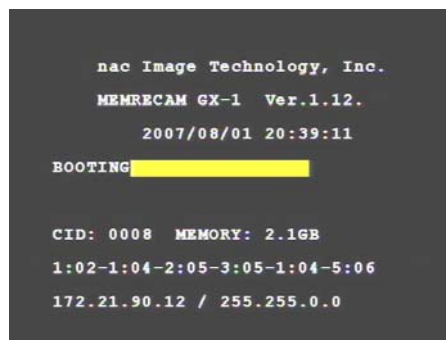


Figure 2-4 System Information Screen

- 4) After the automatic diagnostics have been completed, the test image recorded during automatic diagnostics is displayed and the MEMRECAM GX-1 enters the STOP mode. Nine areas of information are superimposed at the top and bottom of the screen (Figure 2-5).

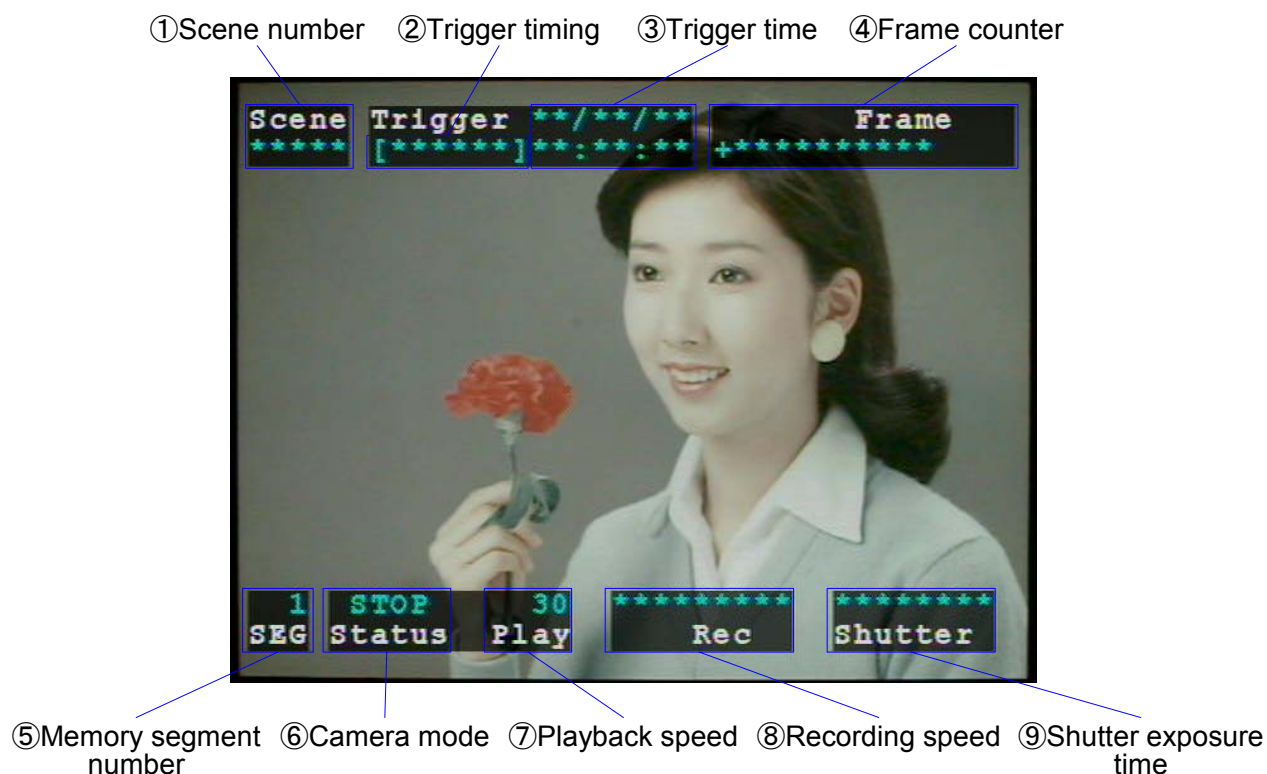


Figure 2-5 STOP mode screen

■ Main Unit Rear Panel LED Display

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

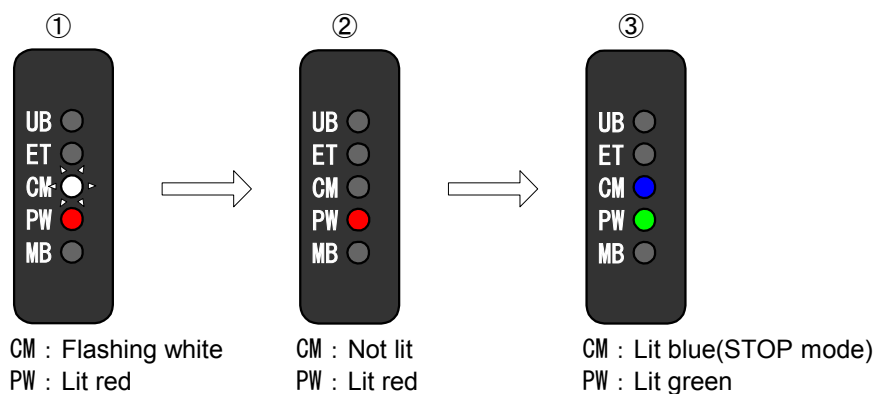


Figure 2-6 The Main Unit Rear Panel LED Display at Startup

2.3.2 Remote Control JPAD3 Startup

- 1) After the MEMRECAM GX-1 power has been turned on, power is supplied to the remote control JPAD3. There is no power switch on the JPAD3 unit.

The version information screen is shown on the JPAD3 LCD display. (Figure2-7)

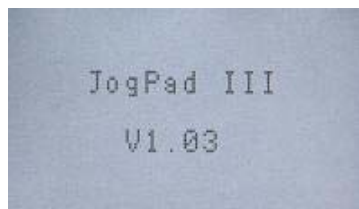


Figure 2-7 JPAD3 version information screen

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

Figure 2-8 Status Screen (STOP mode)

2.4 Stop (STOP Mode)

■ Switching to the STOP Mode

Press STOP .

MEMRECAM GX-1 normally starts up in the STOP mode. If operating in any mode other than STOP, press JPAD3 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)

■ JPAD3 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 JPAD3 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 JPAD3 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.

The superimposed information for the trigger time (Trigger) and the frame counter (Frame) remain unchanged from that of the STOP mode.



Frame 2-11 Image Display (VIEW Mode)

■ JPAD3 Display

The status screen is shown in Figure 2-12, 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.

```
< STATUS >
MODE      : VIEW
FRM RATE  : 1000
FRM SIZE  : 1280x1024
SHUTTER   : OPEN
TRIGGER    : CENTER
ID         : 000
SCENE     : 00000
PLAY       : 30
FRAME     : +000000
TIME      : **/**/**
```

Frame 2-12 JPAD3 Display (VIEW Mode)

■ Rear Panel LED Display

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

2.6 Recording

The MEMRECAM GX-1 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.

Switch to the camera mode for recording. Use the remote control JPAD3 to switch to the camera mode (Figure 2-13).

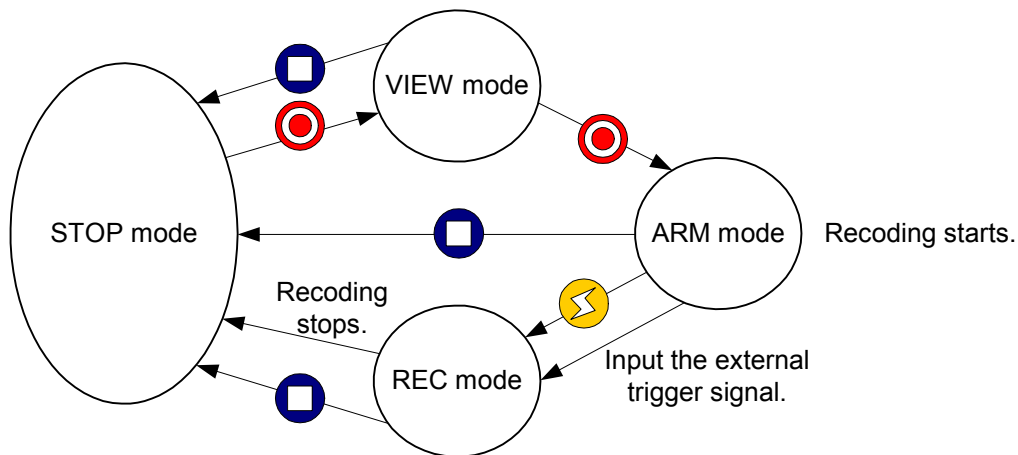


Figure 2-13 Summary of Operations with the JPAD3

2.6.1 ARM Mode

※ Before Switching to the ARM Mode



Caution

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 JPAD3 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 2-14 Image Display (ARM Mode)

■ JPAD3 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 2-15 JPAD3 Display (ARM Mode)


■ Rear Panel LED Display

During the ARM 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 JPAD3 TRIG  is pressed or when an external trigger signal is input from the J1 cable TRIG1 connector. 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 2-16).

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 2-16 Image Display (REC Mode)

■ JPAD3 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 2-17 JPAD3 Display (REC Mode)

■ Rear Panel LED Display

During the REC 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 2-18). 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 2-19).

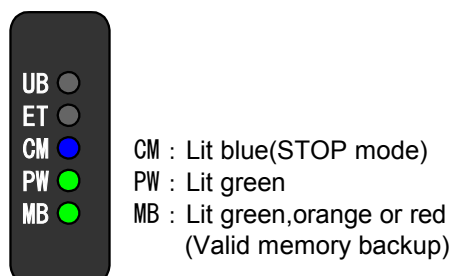


Figure 2-18 Memory Backup with external Power

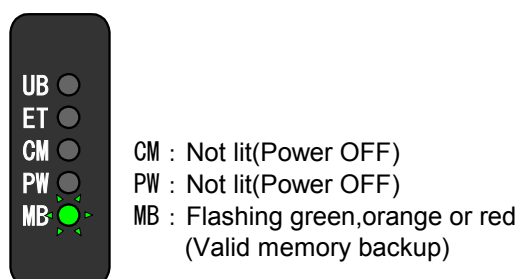


Figure 2-19 Memory Backup with Battery Power

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



- 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-1, 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 JPAD3 key operation follows (Figure 2-20, 21).

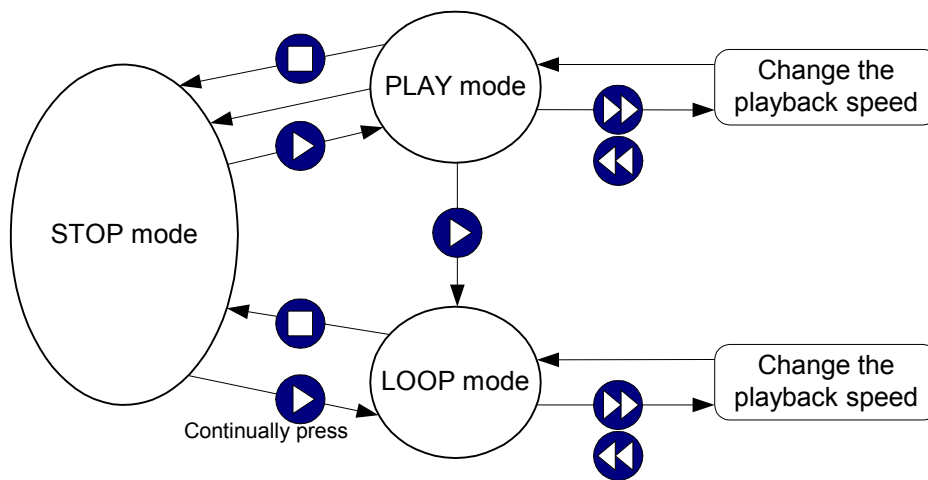


Figure 2-20 Single Frame Playback, Loop Playback and Playback at Varying Speeds with the JPAD3

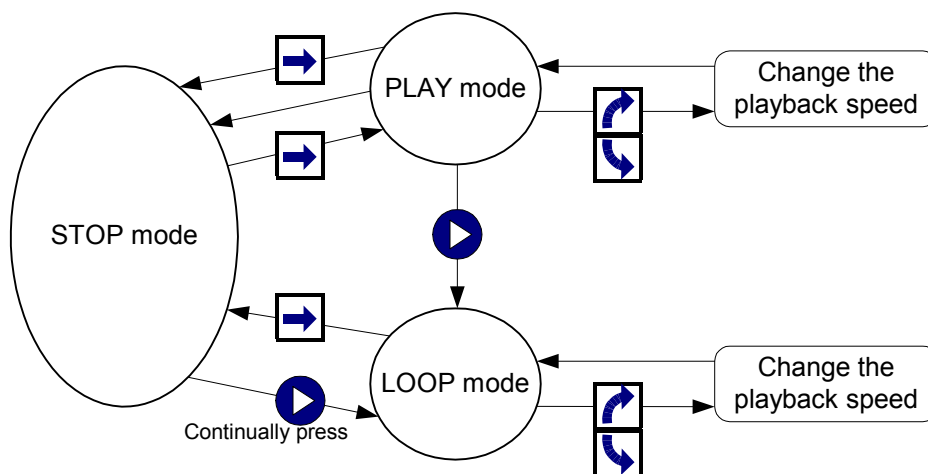





Figure 2-21 Single Frame Playback, Loop Playback and Playback at Varying Speeds with the JPAD3 (using the dial)

2.8.1 Single Frame Playback (PLAY Mode)

■ Single Frame Playback Method

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

During the STOP mode, press JPAD3 **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 2-22).

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



Frame 2-22 Image Display (PLAY Mode)

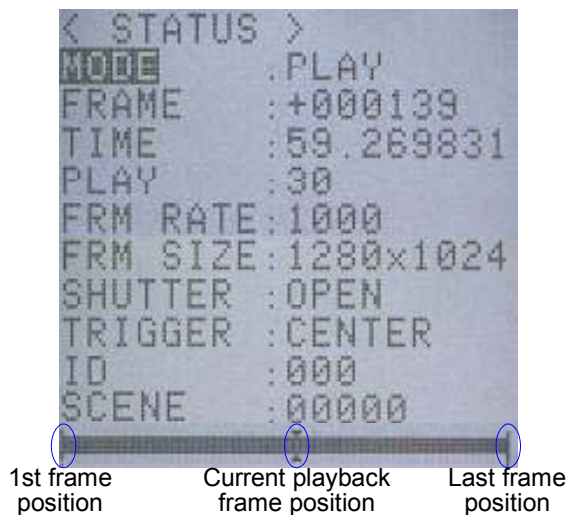
■ JPAD3 Display

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 2-23 JPAD3 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 2-20, 21). 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 2-24 Image Display (LOOP Mode)

■ JPAD3 Display

The status screen is shown in Figure 2-25, 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.

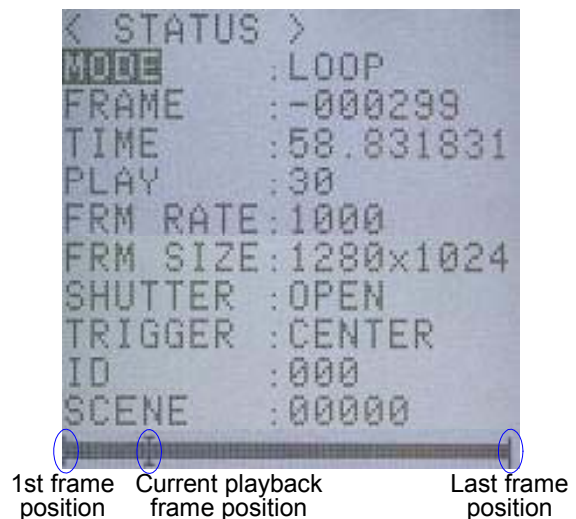




Figure 2-25 JPAD3 Display (LOOP Mode)

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 2-20, 21). 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 2-26, 27), 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 JPAD3 operations is given below to skip forwards, fast forward and rewind. (Figure 2-26,27)

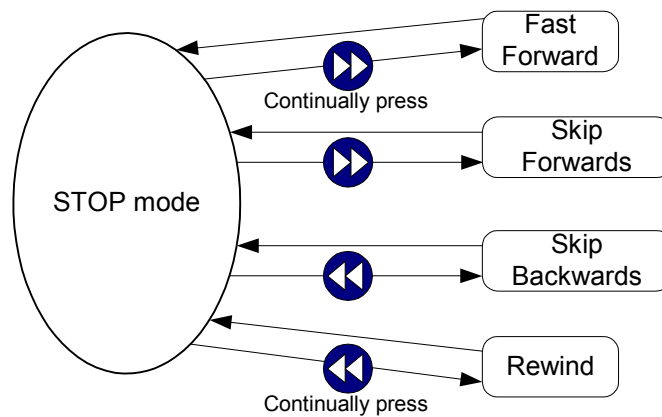


Figure 2-26 Skip Forward, Fast Forward, Rewind using the JPAD3

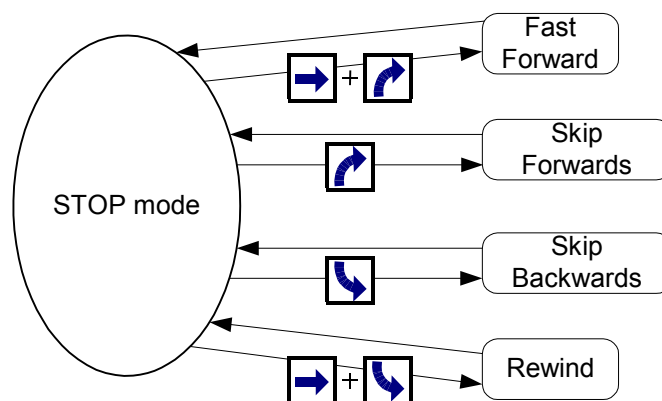


Figure 2-27 Skip Forward, Fast Forward, Rewind using the JPAD3 (Using the Dial)

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 2-28,29) 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 JPAD3 operations for frame jumping is as follows (Figures 2-28,29).

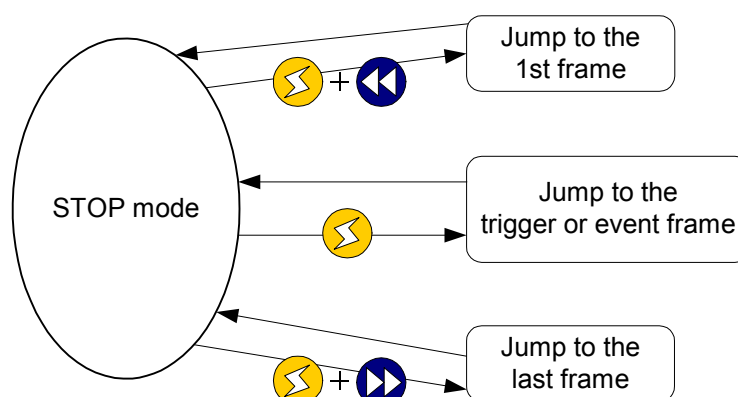


Figure 2-28 Frame Jumping Using the JPAD3

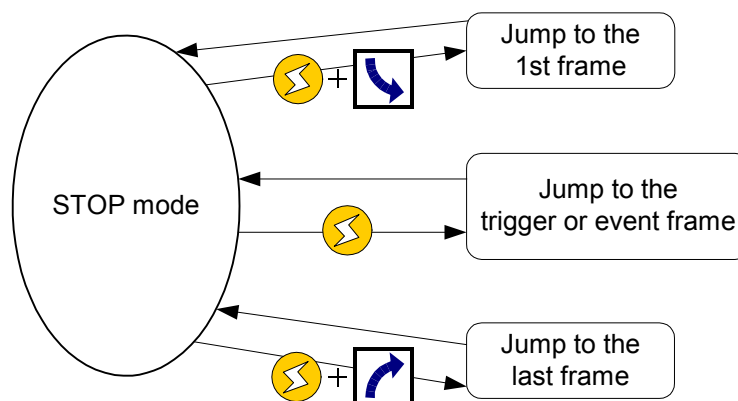


Figure 2-29 Frame Jumping Using the JPAD3 (Using the Dial)

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 2-30,31) 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 JPAD3 operations is given below to set the playback range. (Figures 2-30,31).

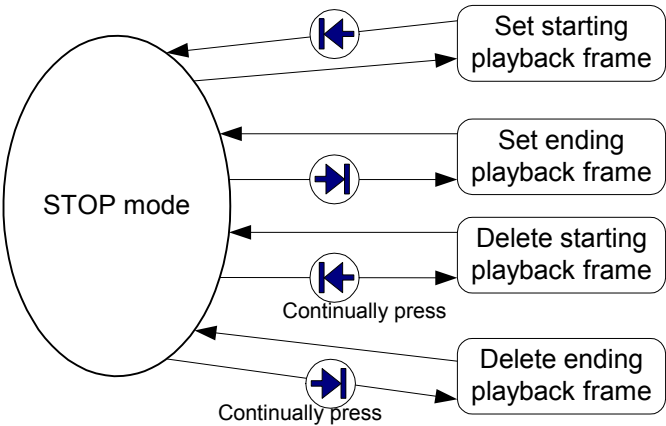


Figure 2-30 Playback Range Settings Using the JPAD3

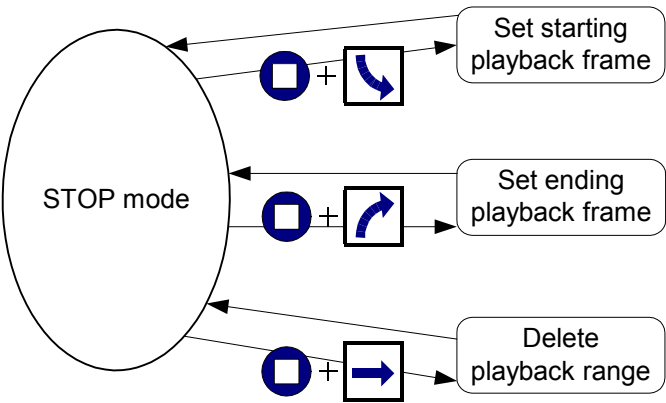







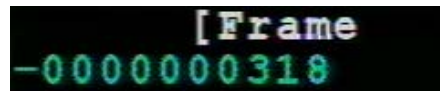
Figure 2-31 Playback Range Settings Using the JPAD3 (Using the Dial)

■ 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 JPAD3 status screen (Figure 2-32).

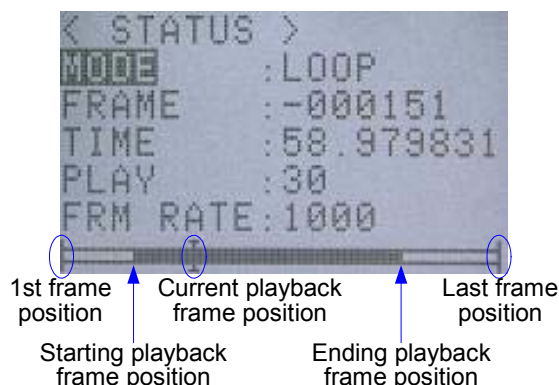




Figure 2-32 JPAD3 Display (During Playback Range Loop Playback)

※ 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 Saving

Connect USB compatible storage media to the USB connector on the J2 cable and send the recorded images to be saved.

The storage method given below is a method that uses the direct download key  on the JPAD3. 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 the J2 cable. Once the storage media is connected, the UB LED on the rear panel of this unit will light in green.
- 3) Press JPAD3 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.

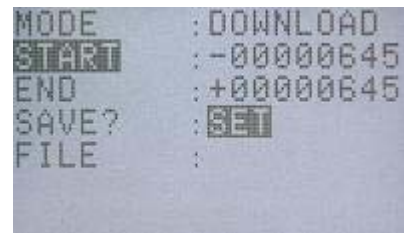



Figure 2-33 Transmit Mode Screen

- 4) "SET" will be flashing so press JPAD3 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.



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.



Figure 2-34 Start Download


- 5) Once the download is complete, "COMPLETE" will be shown, as in Figure 2-35. "SET" will be flashing again so press JPAD3 SET  to finish saving the images.
- 6) After verifying that the access lamp for the storage media is not lit, remove the storage media. The UB LED on the rear panel will turn off.



Figure 2-35 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.

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 JPAD3 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	
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).



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"
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"
EXP TIME	Exposure timing setting	
SYNC TIME	Synchronized time setting	
SYNC SEL	Synchronized signal setting	
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
AE	Automatic exposure setting	
AE AREA	Automatic exposure area measurement 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	
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 JPAD3. 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.

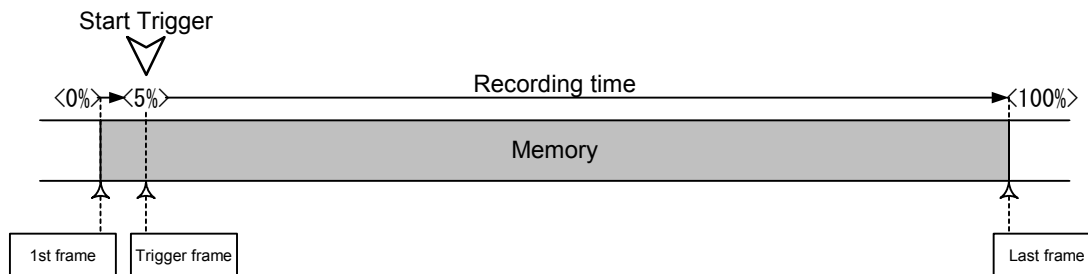


Figure 3-5 Recording with the Start Trigger

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.

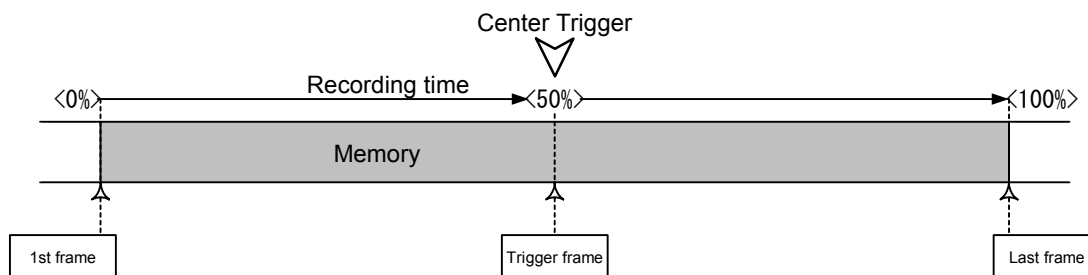


Figure 3-6 Recording with the Center Trigger

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)

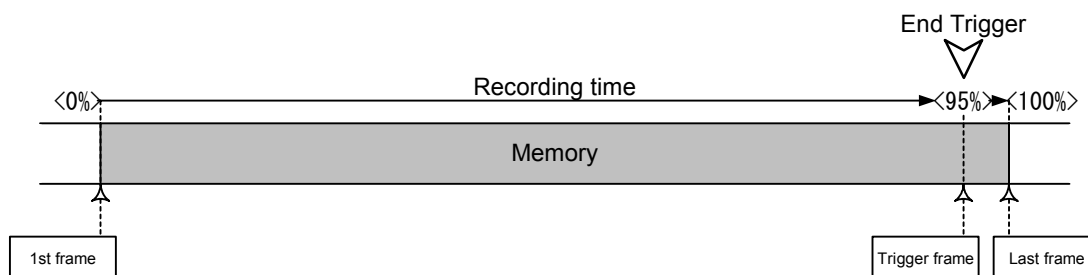


Figure 3-7 Recording with the End Trigger

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%.

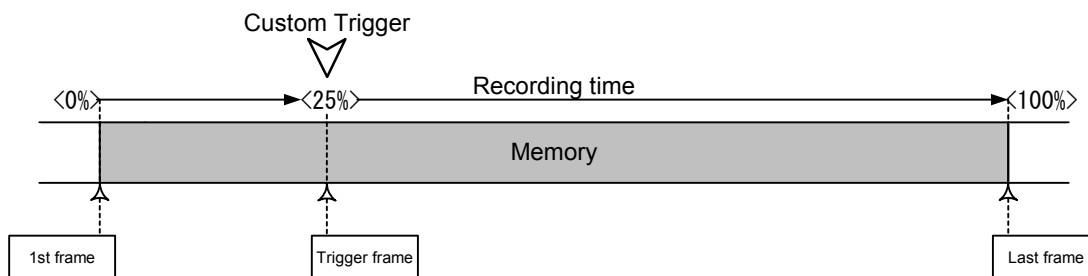


Figure 3-8 Recording with the Custom Trigger (+25%)

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)

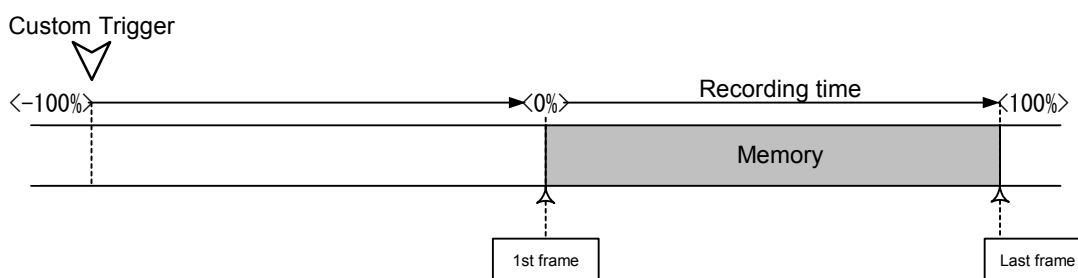


Figure3-9 Recording with the Custom Trigger (-100%)

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 JPAD3. 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).
- 3) Use the arrows   to select the recording speed.



Figure 3-10 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
8000	8,000 pps
10000	10,000 pps
15000	15,000 pps
20000	20,000 pps
25000	25,000 pps
30000	30,000 pps
40000	40,000 pps
50000	50,000 pps
60000	60,000 pps



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 JPAD3.






- 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.



Figure3-11 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 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 960(V) pixel
1024 x 576	1280(H) x 960(V) pixel
928 x 928	928(H) x 928(V) pixel
896 x 672	896(H) x 672(V) pixel
800 x 800	800(H) x 800(V) pixel
768 x 432	768(H) x 432(V) pixel
704 x 704	704(H) x 704(V) pixel
704 x 528	704(H) x 528(V) pixel
640 x 480	640(H) x 480(V) pixel
608 x 608	608(H) x 608(V) pixel
576 x 432	576(H) x 432(V) pixel
512 x 512	512(H) x 512(V) pixel
512 x 384	512(H) x 384(V) pixel
464 x 464	464(H) x 464(V) pixel
384 x 288	384(H) x 288(V) pixel
368 x 368	368(H) x 368(V) pixel
320 x 240	320(H) x 240(V) pixel
304 x 304	304(H) x 304(V) pixel
256 x 256	256(H) x 256(V) pixel
256 x 192	256(H) x 192(V) pixel
224 x 224	224(H) x 224(V) pixel
192 x 144	192(H) x 144(V) pixel
176 x 176	176(H) x 176(V) pixel
144 x 144	144(H) x 144(V) pixel
128 x 128	128(H) x 128(V) pixel
128 x 96	128(H) x 96(V) pixel
96 x 96	96(H) x 96(V) pixel
64 x 64	64(H) x 64(V) pixel
32 x 64	32(H) x 64 (V) pixel
8 x 64	8(H) x 64 (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 JPAD3.

- 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).









Figure 3-12 CUSTOM F

- 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



Figure 3-13 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.



Figure 3-14 FRM RATE(Custom)

- 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.



Figure 3-15 FRM SIZE(Custom)

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 JPAD3. 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.



Figure 3-16 SHUTTER

OPEN	1/ recording speed sec
100	1/ 100 sec
250	1/ 250 sec
500	1/ 500 sec
1 k	1/ 1,000 sec
2 k	1/ 2,000 sec
5 k	1/ 5,000 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

- 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.



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 Automatic Exposure Control Settings (AE)

While in the VIEW mode, the automatic exposure control can be set from the VIEW MENU on the JPAD3.

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.



Figure 3-18 AE

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

3.2.7 Select Area for Automatic Exposure Control (AE AREA)

While in the VIEW mode, the area for measuring the brightness for automatic exposure time can be selected from the VIEW MENU on the JPAD3.

When using the automatic exposure control, the area for measuring the brightness of the photographed image can be designated.






- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Select "AE AREA" from the VIEW MENU using the arrows  .
- 3) Use the arrows   to select the area for measuring the brightness.



Figure 3-19 AE AREA

FULL	The area for measuring the brightness is the entire image photographed
CENTER	The area for measuring the brightness is center portion of the image photographed (25% of the area)
UPPER	The area for measuring the brightness is the top half of the image photographed
LOWER	The area for measuring the brightness is the lower half of the image photographed
LEFT	The area for measuring the brightness is the left half of the image photographed
RIGHT	The area for measuring the brightness is the right half of the image photographed

3.2.8 DRES Mode Settings (DRES)

While in the VIEW mode, the DRES mode can be set from the VIEW MENU on the JPAD3.

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.






- 1) While in the VIEW mode, press MENU  to display the VIEW MENU.
- 2) Select "DRES" from the VIEW MENU using the arrows  . (Figure 3-20)
- 3) Use the arrows   to select the dynamic range in DRES mode.



Figure 3-20 DRES

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%

3.2.9 Recording Bit Length Settings (DEPTH)

While in the VIEW mode, the recording bit length can be set from the VIEW MENU on the JPAD3.

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 3-21)
- 3) Use the arrows   to select the recording bit length.



Figure 3-21 DEPTH

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

3.2.10 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 JPAD3.

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 3-22) .
- 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.



Figure 3-22 SCENE

3.2.11 Memory Segment Settings (SEG SIZE)

While in the STOP mode, the number of memory segments can be set from the SYS MENU on the JPAD3.

The recording memory can be segmented into a maximum of 16 memory segments. 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 3-23) .
- 3) Select "SEG SIZE" and select the number of memory segments using the arrows  .



Figure 3-23 SEG SIZE(SYS SET)

4GBX1	No memory segmentation
2GBX2	Segment into two 2GB segments
1GBX4	Segment into four 1GB segments
512MBX8	Segment into eight 512MB segments
256MBX16	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 3-24).
If there are no problems erasing the images saved in the memory, press SET  to segment the memory.

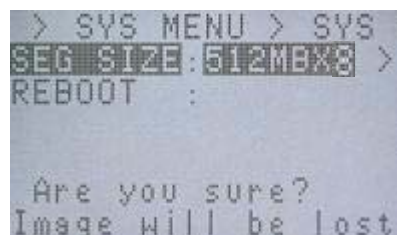








Figure 3-24 Verification message

3.2.12 External Trigger Signal Selection (TRIG SEL)

While in the STOP mode, the external trigger signals can be set from the SYS MENU on the JPAD3.

The method of inputting the recording trigger signals can be performed by operating the special remote control JPAD3 or via external trigger signal input from the J1 cable TRIG1 connector 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 3-25) .
- 3) Select "TRIG SEL" and use the arrows   to select the external trigger signal.

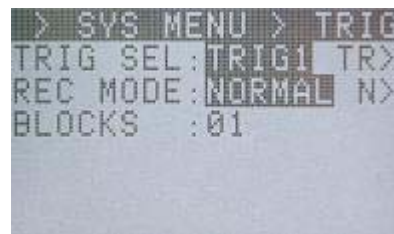


Figure3-25 TRIG SEL(TRIG SET)

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】** .

3.2.12.1 External Trigger Signals from TRIG1

External trigger signal from the TRIG1 connector is input into the MEMRECAM GX-1 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) .

3.2.12.2 External Trigger Signals from TRIG2

External trigger signal from the TRIG1 connector is input into the MEMRECAM GX-1 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 Recording Method Selection (REC MODE)

While in the STOP mode, the recording method can be selected from the SYS MENU on the JPAD3.

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 JPAD3 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	
	JPAD3 operation	External Trigger Signals
Normal Recording	○	○
Burst Recording	×	○
Multi Trigger Recording	○	○
Event Recording	△	○

× : Trigger input from the JPAD3 does not work with burst recording.

△ : With event recording, the initial trigger input does not work from the JPAD3 and the external trigger input only works with the second and subsequent event trigger input.



3.2.13.1 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 JPAD3 is used to switch to the ARM mode, a warning message will be displayed (Figure 3-26).




Figure 3-26 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.

3.2.13.2 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.



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

3.2.13.3 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 (Figure3-27).
- 3) Select "REC MODE" and use the arrows   to select the recording method.

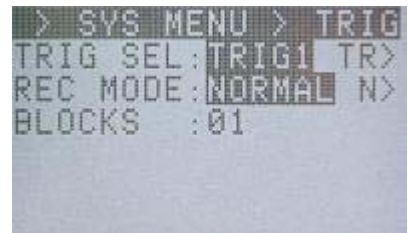








Figure 3-27 REC MODE(TRIG SET)

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.

3.2.13.4 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 **【3.2.13.3 Setting Method】** for the method of setting normal recording.

Next is the recording sequence for each mode.

3.2.13.4.1 NORMAL

Figure 3-28 shows how to switch modes with the JPAD3 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.

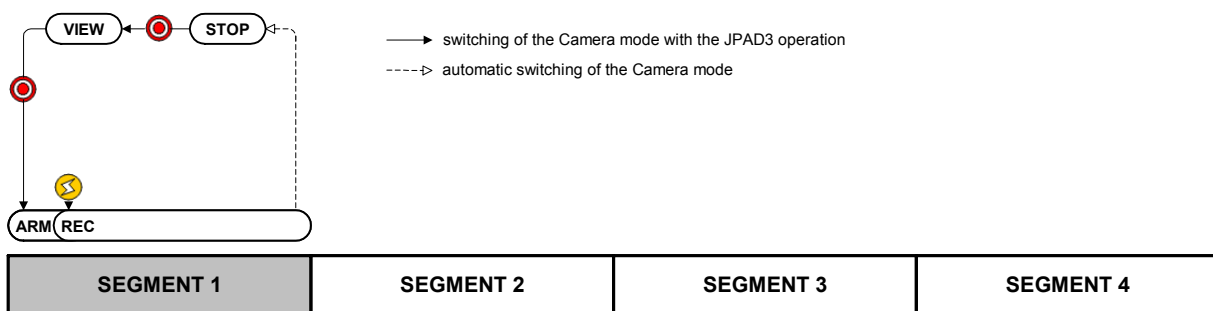










Figure 3-28 Normal Recording (NORMAL, number of segments : 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
 - 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 to switch to the VIEW mode.
 - 3) While in the VIEW mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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.

3.2.13.4.2 NORMAL(A)

Figure 3-29 shows how to switch modes with the JPAD3 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.

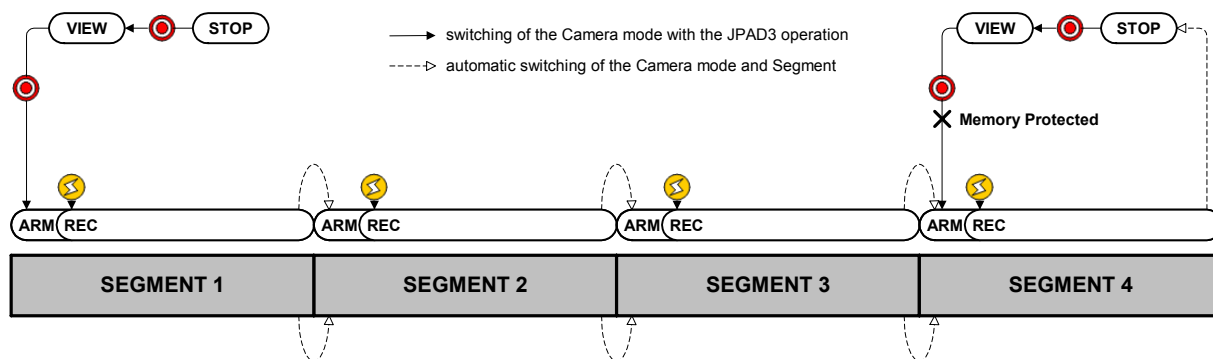











Figure 3-29 Normal Recording (NORMAL(A), Number of Segments : 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
 - 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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 JPAD3 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.

3.2.13.4.3 NORMAL(L)

Figure 3-30 shows how to switch modes with the JPAD3 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.

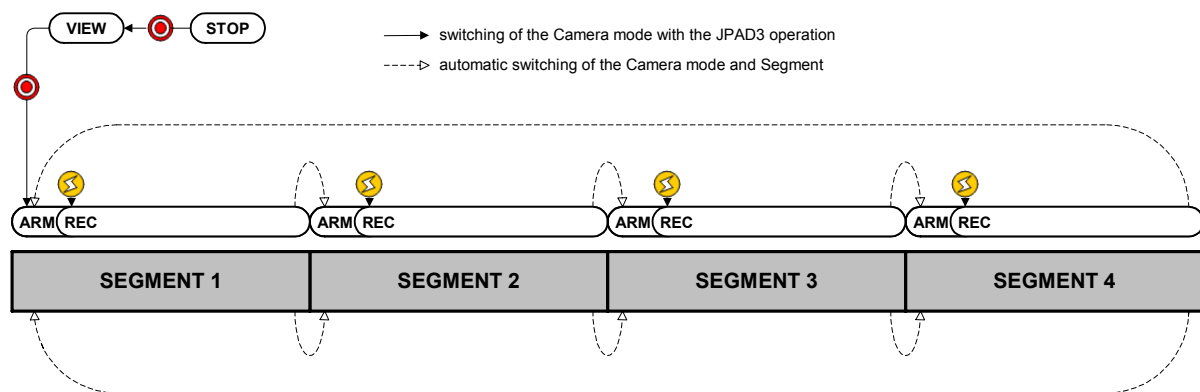












Figure 3-30 Normal Recording (NORMAL(L), Number of Segments : 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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 JPAD3 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.

3.2.13.5 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.

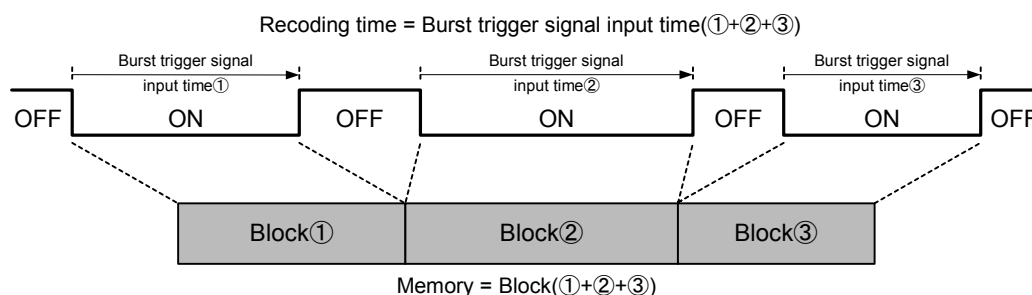


Figure 3-31 Burst Recording

The three modes within burst recording include BURST, BURST (A) and BURST (L). Refer to **【3.2.13.3 Setting Method】** for the method of setting burst recording.

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

3.2.13.5.1 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 JPAD3 during burst recording. Input burst recording signals from the J1 cable TRIG1 connector 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 the **【GXLink User's Manual】** for time stamp settings and to **【5.2.7 Selection of the Frame Time Standard】** for frame time standard settings.

3.2.13.5.2 BURST

Figure 3-32 shows how to switch modes with the JPAD3 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.

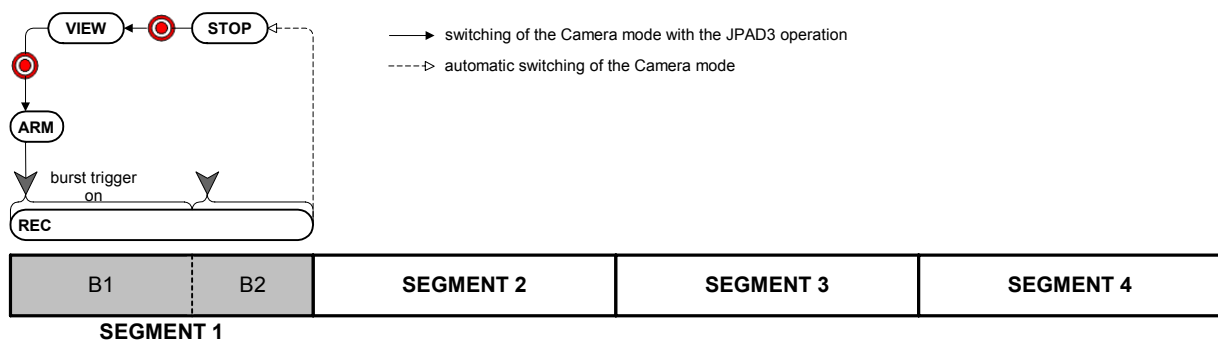









Figure 3-32 Burst Recording (BURST, number of segments : 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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 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.

3.2.13.5.3 BURST(A)

Figure 3-33 shows how to switch modes with the JPAD3 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.

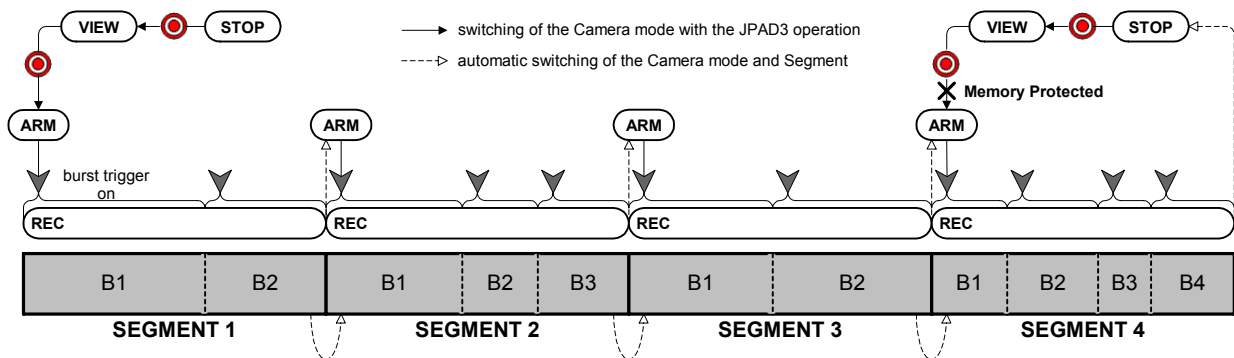


Figure 3-33 Burst Recording (BURST(A), Number of Segments : 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 to switch to the VIEW mode.

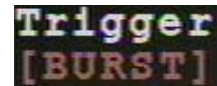
The memory segment number (SEG) superimposed on the image is displayed as "A". Settings in AUTO mode are displayed.






"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 JPAD3 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.

3.2.13.5.4 BURST(L)

Figure 3-34 shows how to switch modes with the JPAD3 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.

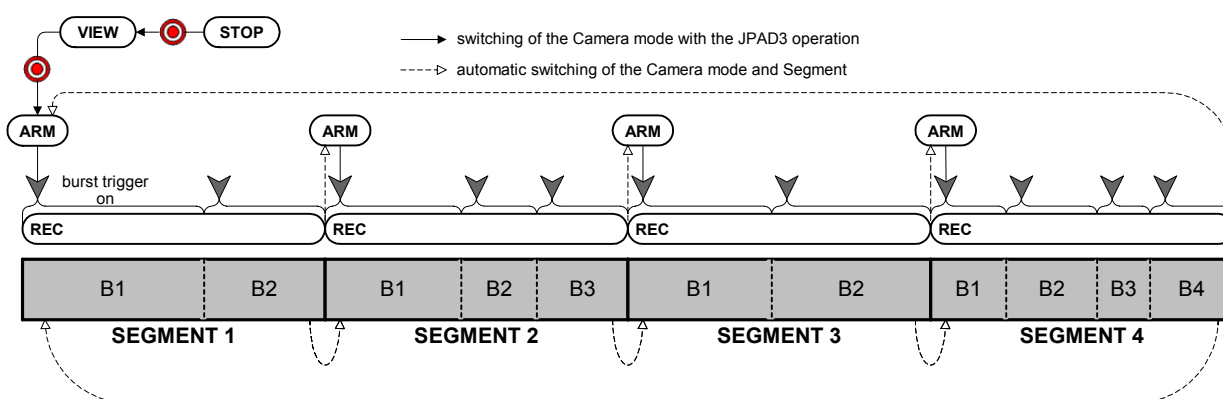



Figure3-34 Burst Recording (BURST(L), Number of Segments : 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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.

3.2.13.6 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 **【3.2.13.3 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.

3.2.13.6.1 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.

3.2.13.6.2 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 3-35 shows how to switch modes with the JPAD3 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.

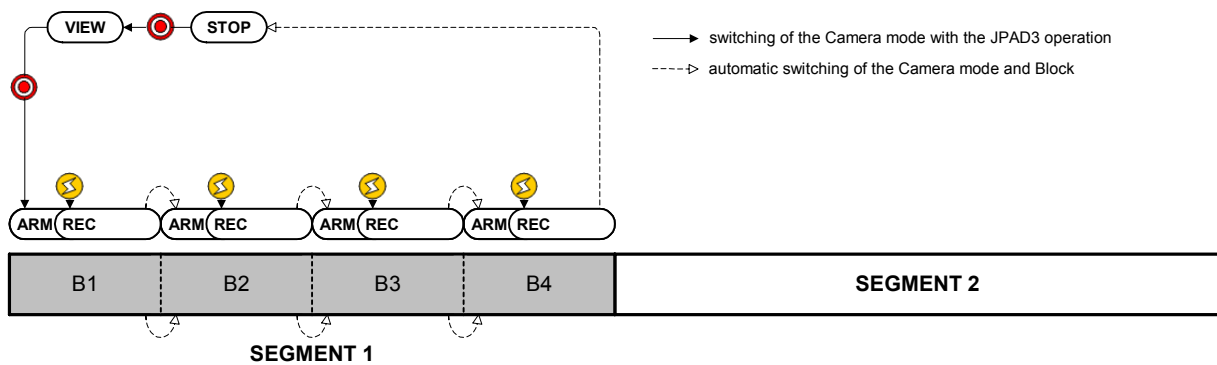












Figure 3-35 Multi Trigger Recording (MULTI(A), Number of Segments: 2, Number of Blocks: 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
 - 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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 JPAD3 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

3.2.13.6.3 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 3-36 shows how to switch modes with the JPAD3 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.

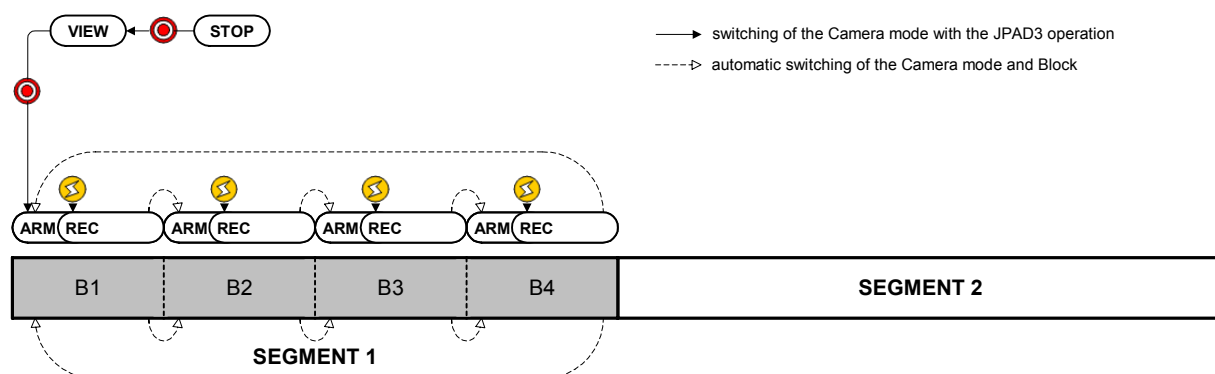



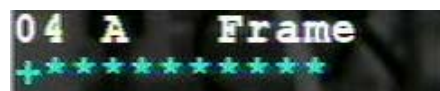








Figure 3-36 Multi Trigger Recording (MULTI(C), Number of Segments: 2, Number of Blocks: 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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 JPAD3 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

3.2.13.6.4 MULTIS(A)

Figure 3-37 shows how to switch modes with the JPAD3 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.

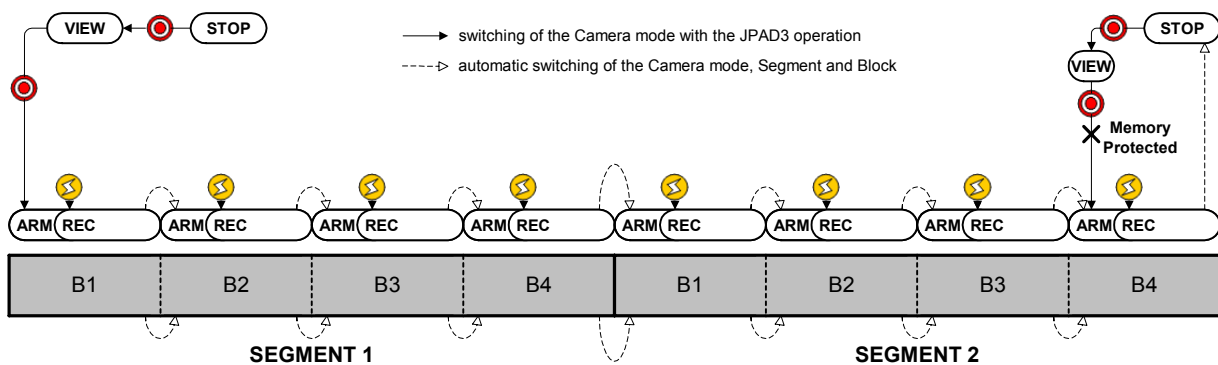


Figure3-37 Multi Trigger Recording (MULTIS(A), Number of Segments: 2, Number of Blocks: 4)



- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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 JPAD3 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.
- 8) 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

3.2.13.6.5 MULTIS(L)

Figure 3-38 shows how to switch modes with the JPAD3 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.

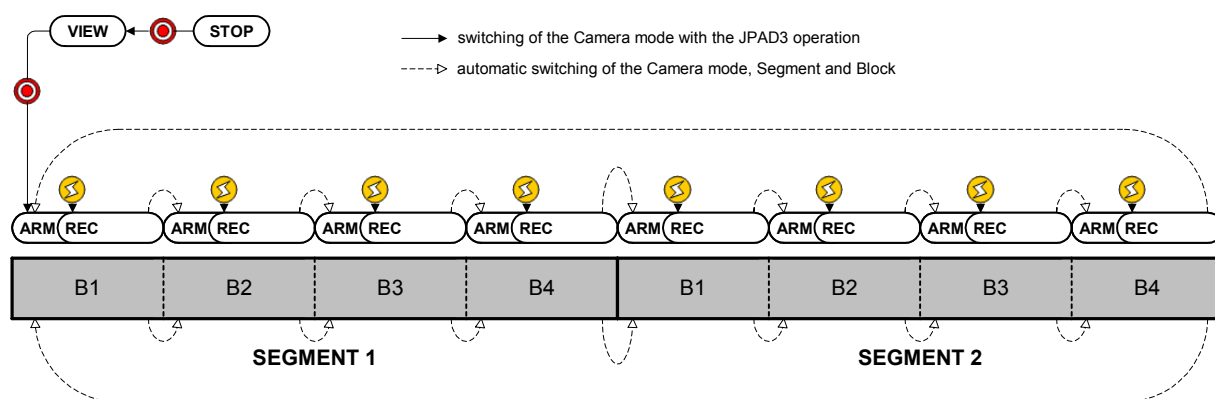



Figure3-38 Multi Trigger Recording (MULTIS(L), Number of Segments: 2, Number of Blocks: 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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 JPAD3 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

3.2.13.7 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 **【3.2.13.3 Setting Method】** for the method of setting event recording.

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

3.2.13.7.1 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 JPAD3 but continuous event trigger input is not possible with the JPAD3. Input event trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector.

3.2.13.7.2 EVENT

Figure 3-39 shows how to switch modes with the JPAD3 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.

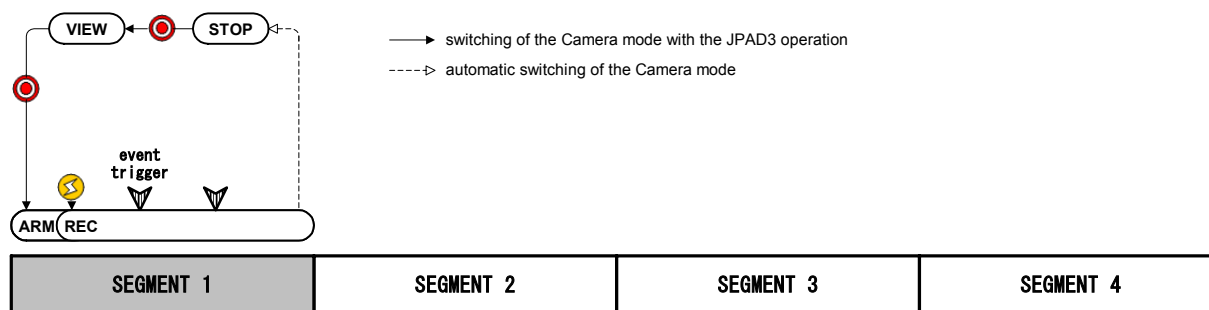











Figure 3-39 Event Recording (EVENT, number of segments : 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
 - 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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 JPAD3 or use the external trigger for input to switch to the REC mode. Continue to input event trigger signals from the J1 cable TRIG1 connector 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

3.2.13.7.3 EVENT(A)

Figure 3-40 shows how to switch modes with the JPAD3 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.

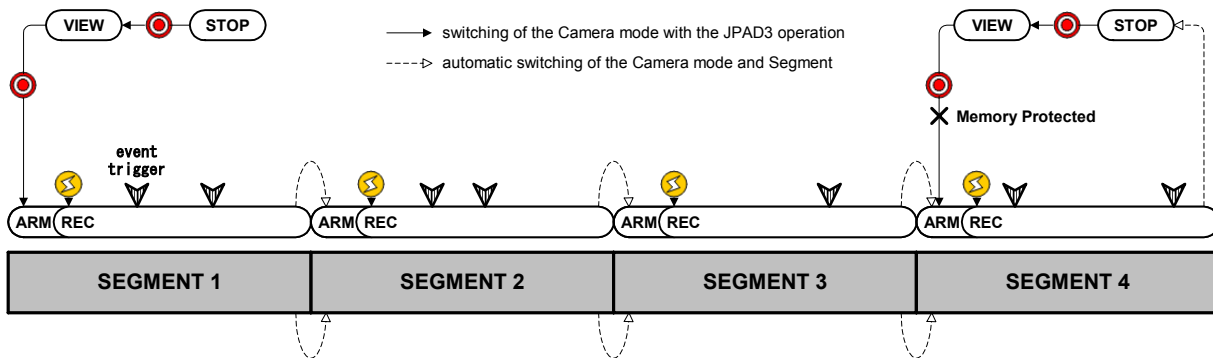


Figure 3-40 Event Recording (EVENT(A), Number of Segments: 4)



- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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 JPAD3 or use the external trigger for input to switch to the REC mode. Continue to input event trigger signals from the J1 cable TRIG1 connector 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.

3.2.13.7.4 EVENT(L)

Figure 3-41 shows how to switch modes with the JPAD3 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.

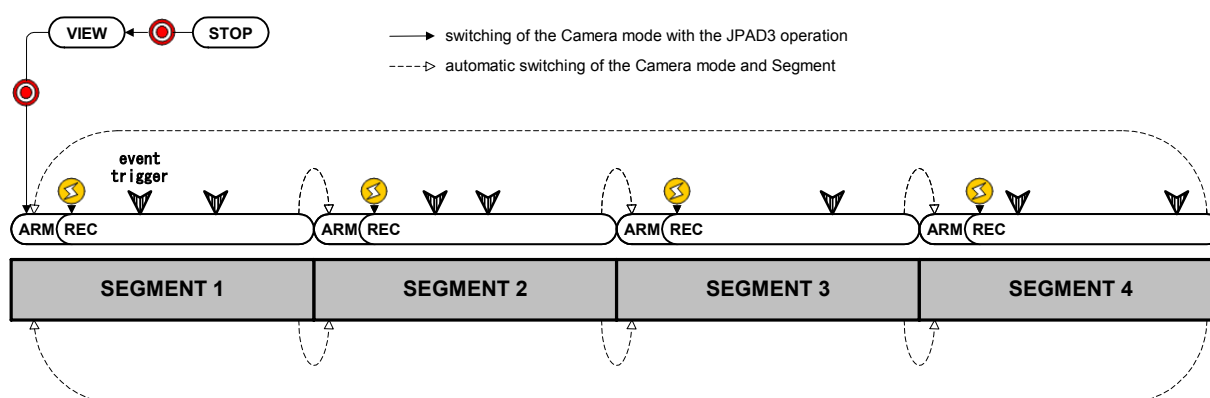

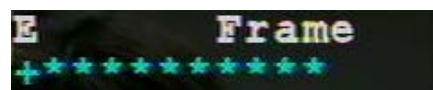




Figure 3-41 Event Recording (EVENT(L), Number of Segments: 4)

- 1) Verify that the MEMRECAM GX-1 is in the STOP mode.
- 2) While in the STOP mode, press VIEW/ARM  on the JPAD3 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 JPAD3 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 JPAD3 or use the external trigger for input to switch to the REC mode. Continue to input event trigger signals from the J1 cable TRIG1 connector 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.



3.2.14 Synchronized Timing Selection (SYNC TIME)

While in the STOP mode, the synchronize timing can be selected from the SYS MENU on the JPAD3.

The MEMRECAM GX-1 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-1 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-1 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-1 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

3.2.14.1 Setting Method

- 1) Select SYS MENU from the TOP MENU.
- 2) Select "SYNC TIME" from the SYS MENU (Figure 3-42).
- 3) Use the arrows   to select the synchronized time.

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




Figure 3-42 SYNC TIME

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

3.2.14.2 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 JPAD3 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.



3.2.15 Synchronized Signal Selection (SYNC SEL)

While in the STOP mode, the synchronized signals can be selected from the SYS MENU on the JPAD3.

The MEMRECAM GX-1 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 (EST1,EST2)
If EST1 or EST2 are selected, the exposure start signals (EST : External Shutter Trigger, Exposure Start) input from the J1 cable EST1 connector or the J3 cable EST2 connector are the standard. The minimum frequency for the EST signal is 0Hz so ultra high speed recording is possible.

3.2.15.1 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 3-43 SYNC SEL

INT	Synchronized with the internal synchronization signals of the camera
EST1	Synchronized with the EST1 signal from the J1 connector
EST2	Synchronized with the EST2 signal from the J3 connector

The EST1 signal and the EST2 signal are handled in an identical manner but cannot be used at the same time.

It is possible to set the polarity of the exposure start signal from the EST1 connector and the EST2 connector. Refer to **【3.2.16 External Input/Output Signal Polarity Selection】**.

3.2.15.2 Synchronized EST Signal Recording

3.2.15.2.1 Precautions for Use

- Filter Value Settings
If there is noise in the EST signal, set a noise filter value to activate the filter. Refer to the **【GXLink User's Manual】** for the setting method.
- 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.

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

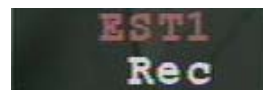
3.2.15.2.2 Display During Recording

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

1) VIEW Mode

Verify that "EST1" or "EST2" is displayed in the recording speed superimposed on the image and that the synchronized signal setting shows EST1 or 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.

3.2.16 External Input/Output Signal Polarity Selection (SIG SET)

While in the STOP mode, the polarity of the external input/output signal can be selected from the SYS MENU on the JPAD3.

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 (EST1,EST2)
- Exposure Pulse Output (EPO)
- ARM Command Input (ARM CMD)
- ARM Status Output (ARM STS)
- FAULT Status Output (FAULT)










- 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 (Figure3-44).
- 4) Select the external input/output signal to be set and use the arrows   to select the polarity.



Figure 3-44 SIG SET

TRIG1	POSI	Search for the external trigger signal from the J1 cable by the rising edge
	NEGA	Search for the external trigger signal from the J1 cable 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
EST1	POSI	Search for the EST signal from the J1 cable by the rising edge
	NEGA	Search for the EST signal from the J1 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
ARM CMD	POSI	Detect the ARM command signal by the rising edge
	NEGA	Detect the ARM command signal by the falling edge
ARM STS	POSI	Output the H level signal during the ARM mode
	NEGA	Output the L level signal during the ARM mode
FAULT	POSI	Output the H level signal with fail status
	NEGA	Output the L level signal with fail status

3.2.17 Exposure Timing Selection (EXP TIME)

While in the STOP mode, the sensor exposure times for synchronized signal recording can be selected from the SYS MENU on the JPAD3.

The sensor exposure times for synchronized signal recording is different depending on the MEMRECAM GX-1 or other MEMRECAM series cameras (fx,ci cameras). When conducting synchronized recording with the MEMRECAM GX-1 and other MEMRECAM series cameras, the exposure times 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. (Figure3-45)
- 4) Use the arrows   to select the exposure time.



Figure 3-45 EXP TIME

GXnative	Start exposure with rising synchronized signal recording (Setting only when recording in GX-1)
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)

【GXLink User's Manual】 for synchronized recording with multiple camera connections between MEMRECAM GX-1 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 3-46)
- 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 3-46 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 3-47)
- 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

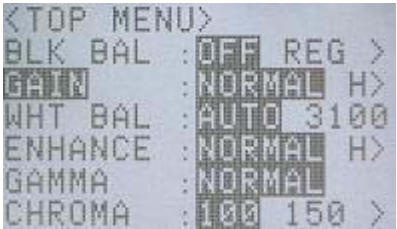







Figure 3-47 GAIN (TOP MENU)

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. (Figure3-48)
- 3) Use the arrows   to select the enhance.

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



Figure3-48 ENHANCE(VIEW MENU)

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. (Figure3-49)
- 3) Use the arrows   to select the enhance.

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

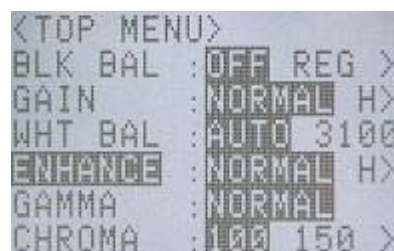







Figure 3-49 ENHANCE (TOP MENU)

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. (Figure3-50)
- 3) Use the arrows   to select the gamma.

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



Figure 3-50 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. (Figure3-51).
- 3) Use the arrows   to select the gamma.

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








Figure 3-51 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 3-52)
- 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 3-52 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. (Figure3-53)
- 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 3-53 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 3-54)
- 3) Use the arrows   to select the knee.

OFF Knee Correction OFF
ON Knee Correction ON

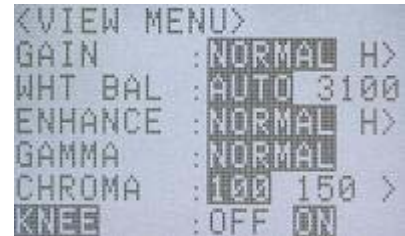







Figure 3-54 KNEE (VIEW MENU)

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 3-55)
- 3) Use the arrows   to select the knee.

OFF Knee Correction OFF
ON Knee Correction ON



Figure 3-55 KNEE (TOP MENU)

3.3.6 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. (Figure3-56)
- 4) Use the arrows   to select the black balance.



Figure 3-56 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.



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.

3.3.7 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.

3.3.7.1 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. (Figure3-57)
- 3) Use the arrows   to select the white balance.



Figure 3-57 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.

3.3.7.2 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 3-58)
- 3) Use the arrows   to select the white balance.



Figure 3-58 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

3.3.8 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.

3.3.8.1 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 3-59)
- 3) Use the arrows   to select the zoom.



Figure 3-59 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 |

3.3.8.2 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 3-60)
- 4) Use the arrows   to select the zoom.



Figure 3-60 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 |

3.3.9 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.

3.3.9.1 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 3-61)
- 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 3-61 SCROLL (VIEW MENU)

3.3.9.2 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 3-62)
- 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 3-62 SCROLL (SYS MENU)

3.3.10 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 3-63)
- 4) Use the arrows   to select the low light mode.



Figure 3-63 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.

3.3.11 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 3-64). 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.

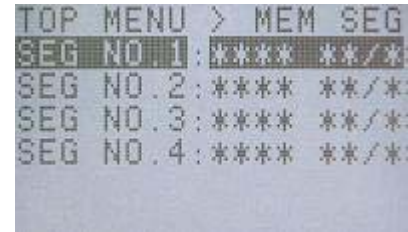


Figure 3-64 MEM SEG

(Figure 3-64 shows 4 memory segments that haven't been recorded yet)

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  .

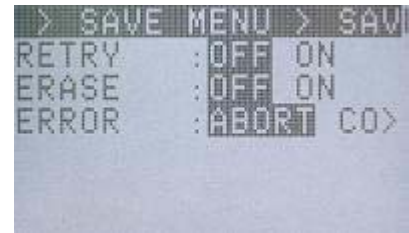









Figure 4-3 SAVE SET

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】**.

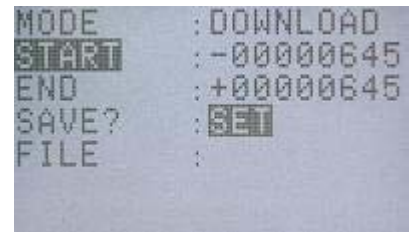









Figure 4-4 Transfer Mode Screen

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.

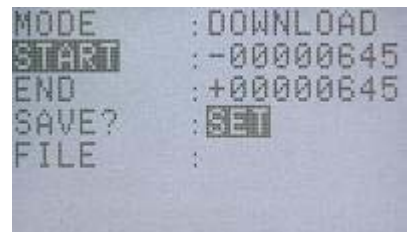


Figure 4-4 Transfer Mode Screen

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
- SYSYTEM 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"
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).






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	
CAFM DIS	Display/do not display mark for center of image	
FRM DISP	Frame counter display setting	
FRM TIME	Frame time standard setting	
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"
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	
TRIG SET	External trigger setting, recording method setting	Refer to Chapter 3 "Recording and Playback Settings"
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).

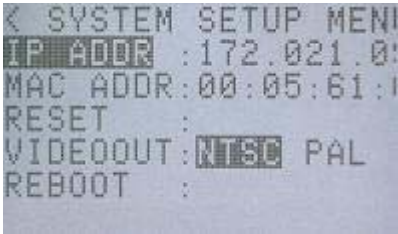




Figure 5-3 SYSTEM SETUP MENU

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/Do Not Display Settings for 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 5-9).
- 4) Use the arrows   to select display/do not display for the center mark of the image. (Figure 5-10)



Figure 5-9 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 5-9 10 CAFM DIS Settings

5.2.6 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 5-11).
- 4) Use the arrows   to select the frame counter display (Figure 5-12).



Figure 5-11 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

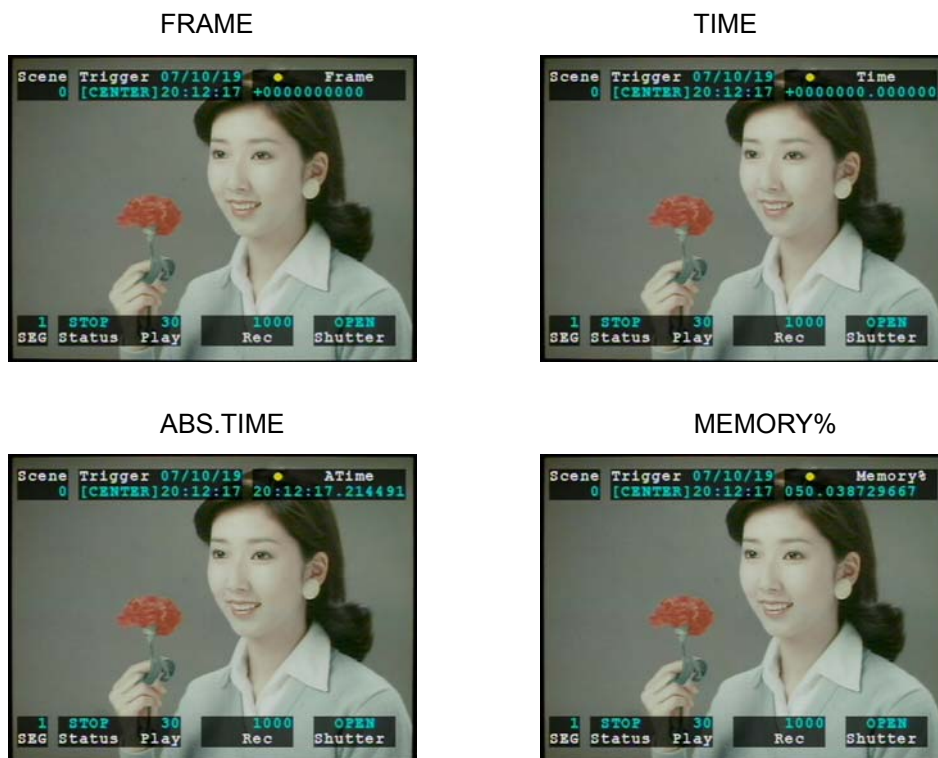


Figure 5-12 FRM DISP Settings

5.2.7 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 5-13). 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.

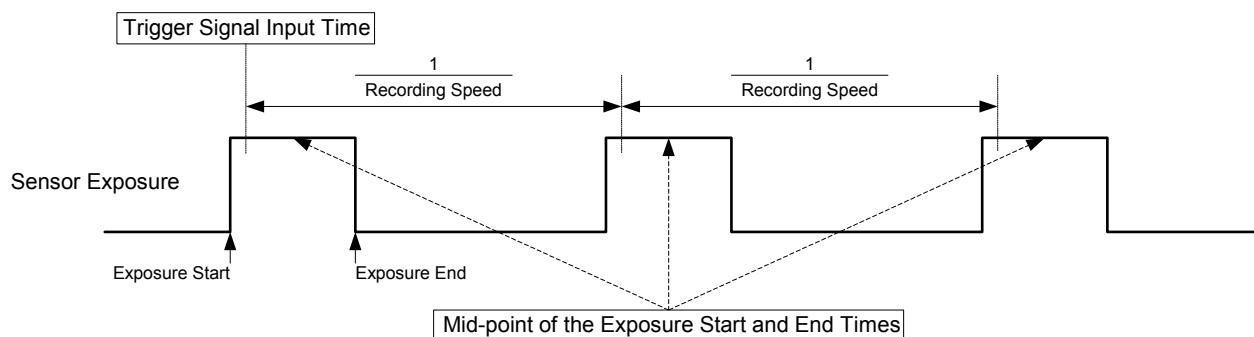


Figure 5-13 Standard Timing for the Frame Time









- 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 5-14).
- 4) Use the arrows   to select the frame time standard.



Figure 5-14 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

5.2.8 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.









- 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 "VIDEOOUT" from the SYS MENU (Figure 5-15).
- 4) Use the arrows   to select display/do not display the image.











Figure 5-15 VIDEOOUT

OFF Do not display the image
ON Display the image

5.2.9 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 5-16).
- 4) Use the arrows   to select the remote control operation sound.

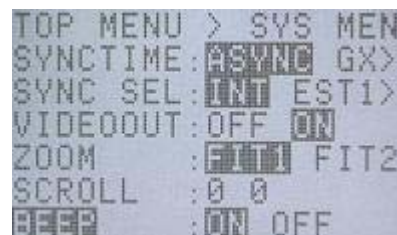



Figure 5-16 BEEP

ON Operation sound
OFF No operation sound









5.2.10 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 5-17).
- 4) Use the arrows   to select the auto view function.

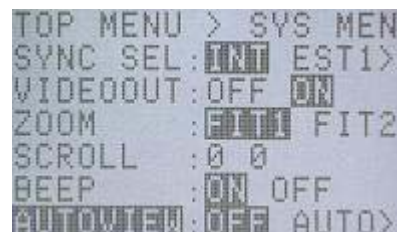



Figure 5-17 AUTOVIEW

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)
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 Saving]** or **[GXLink User's Manual]** for the method of saving images.

5.2.11 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.

- 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 5-18)
- 4) Select the warnings to be set and use the arrows   to select display/do not display for the warnings.

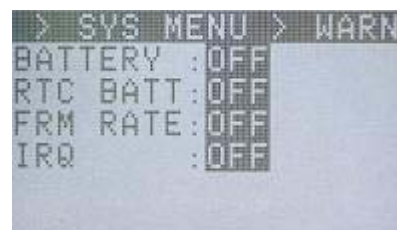













Figure 5-18 WARNING

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

5.2.12 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 5-19).
- 4) Use the arrows   and the arrows   to verify all of the system information.

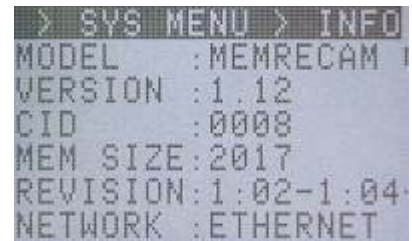
















Figure 5-19 INFO

5.2.13 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 5-20). 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 5-21).

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

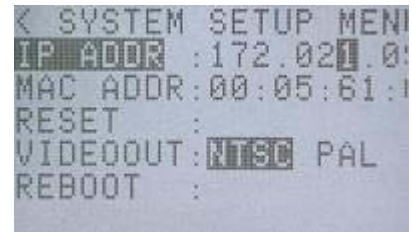


Figure 5-20 IP ADDR

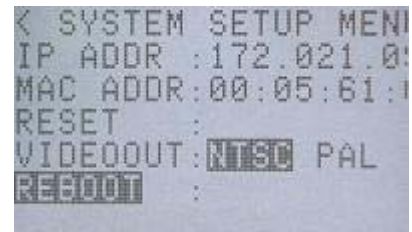


Figure 5-21 REBOOT

5.2.14 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 5-22).
All of the settings will revert to the factory settings.



Figure 5-22 RESET

- 3) Use the arrows   to select "REBOOT" and press SET  (Figure 5-23).
Restart the system using "REBOOT" to show the new settings.

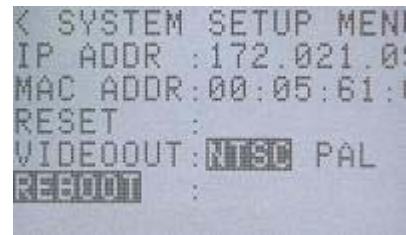









Figure 5-23 REBOOT

5.2.15 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 5-24).
- 3) Use the arrows   to select the video output method.

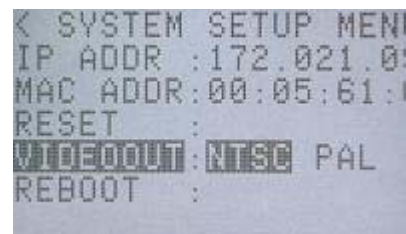





Figure 5-24 VIDEOOUT

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 5-25).
Restart the system using "REBOOT" to show the video method.

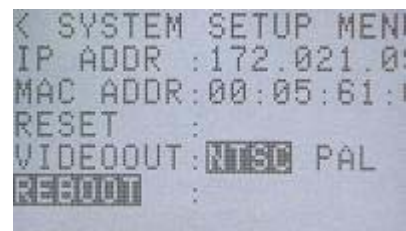


Figure 5-25 REBOOT

6

Troubleshooting

6.1 Troubleshooting

The following suggestions are provided on the causes of potential problems during use of the MEMRECAM GX-1 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 **【3.2.11 Memory Segment Settings】**.
- ◆ Select a recording method other than the AUTO mode from **【3.2.13 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 Saving】** 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 **【5.2.10 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 Saving】** or **【GXLink User's Manual】** for the method of saving images.

6.1.2 Trigger Input Does Not Work With The Remote Control JPAD3

Cause

When the recording method is set to burst recording, the trigger input does not work with the remote control JPAD3, and only functions with external trigger input.

Solution

Input external trigger signals from the J1 cable TRIG1 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 J1 cable TRIG1 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 **【3.2.12 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 **【3.2.16 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 The EST Signals Are Not Synchronized

Cause ①

The two systems to set EST input include the J1 cable EST1 and the J3 cable EST2 (option). When one was set as the valid EST input, it is possible that the EST input system used did not match the EST input system set.

Solution

Select the EST input system that is the same as the EST input system to be used, based on **【3.2.15 Synchronized Signal Settings】**.

Cause ②

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 **【3.2.15.2.1 Precautions for Use, 【7.5 Input/Output Connector】 and 【APPENDIX B】**. Also, follow **【3.2.16 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

6.1.5 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.

6.1.6 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, 8,000, 10,000, 15,000, 20,000, 25,000, 30,000, 40,000, 50,000, 60,000 pps
- 2) With Custom Recording speeds 50~60,000 pps, 1pps increments
- 3) Using EST and Custom Recording speed Function 0~60,000 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

Frame Size (Maximum Recording Speed) Pixels			Image Area Size
Full: SXGA	(2,000pps or less)	1280(H)X1024(V)	27.78(H)X22.22(V) mm
SXGA 4:3	(2,000pps or less)	1280(H)X960(V)	27.78(H)X20.83(V) mm
Split 4:3	(2,500pps)	1152(H)X864(V)	24.99(H)X18.74(V) mm
Split	(2,500pps)	1024(H)X1024(V)	22.22(H)X22.22(V) mm
HDTV720	(2,500pps or less)	1280(H)X720(V)	27.78(H)X15.62(V) mm
Split	(3,000pps)	928(H)X928(V)	20.13(H)X20.13(V) mm
XGA	(3,000pps or less)	1024(H)X768(V)	22.22(H)X16.66(V) mm
Split	(4,000pps)	800(H)X800(V)	17.36(H)X17.36(V) mm
Split 4:3	(4,000pps)	896(H)X672(V)	19.44(H)X14.58(V) mm
Split 16:9	(4,000pps)	1024(H)X576(V)	22.22(H)X12.50(V) mm
Split	(5,000pps)	704(H)X704(V)	15.27(H)X15.27(V) mm
Split	(6,000pps)	608(H)X608(V)	13.19(H)X13.19(V) mm
Split 4:3	(6,000pps)	704(H)X528(V)	15.27(H)X11.45(V) mm
VGA	(6,000pps or less)	640(H)X480(V)	13.89(H)X10.42(V) mm
Split 16:9	(6,000pps)	768(H)X432(V)	16.67(H)X9.37(V) mm
Split	(8,000pps)	512(H)X512(V)	11.11(H)X11.11(V) mm
Split 4:3	(8,000pps)	576(H)X432(V)	12.49(H)X9.37(V) mm
Split	(10,000pps)	464(H)X464(V)	10.07(H)X10.07(V) mm
Split 4:3	(10,000pps)	512(H)X384(V)	11.11(H)X8.33(V) mm
Split	(15,000pps)	368(H)X368(V)	7.98(H)X7.98(V) mm
CIF	(15,000pps or less)	384(H)X288(V)	8.33(H)X6.24(V) mm
Split	(20,000pps)	304(H)X304(V)	6.60(H)X6.60(V) mm
QVGA	(20,000pps or less)	320(H)X240(V)	6.94(H)X5.20(V) mm
Split	(25,000pps)	256(H)X256(V)	5.56(H)X6.94(V) mm
Split	(30,000pps)	224(H)X224(V)	4.86(H)X4.86(V) mm
Split 4:3	(30,000pps)	256(H)X192(V)	5.55(H)X4.17(V) mm
Split	(40,000pps)	176(H)X176(V)	3.82(H)X3.82(V) mm
Split 4:3	(40,000pps)	192(H)X144(V)	4.17(H)X3.13(V) mm
Split	(50,000pps)	144(H)X144(V)	3.12(H)X3.12(V) mm
Split	(60,000pps)	128(H)X128(V)	2.78(H)X2.78(V) mm
Split 4:3	(60,000pps)	128(H)X96(V)	2.78(H)X2.08(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 $\pm 0.5\text{mm}$.

- 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 (pps) Exposure Time (Sec)	50	60	100	250	500	750	1000	1500	2000
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. △ 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)

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.

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

Possible Settings and Intervals for Exposure Times

Photographic Speed (pps)	Pixels (HxV)	Setting (us)		Setting Intervals (us)
		Maximum	Minimum	
100or less	1280x1024	9994	6	1 or 2
250	1280x1024	3995	6	1 or 2
500	1280x1024	1995	6	1 or 2
1,000	1280x1024	995	6	1 or 2
2,000	1280x1024	494	6	1 or 2
3,000	928x928	328	5	1 or 2
4,000	800x800	246	5	1 or 2
5,000	704x704	195	4	1 or 2
6,000	608x608	163	4	1
8,000	512x512	122	4	1
10,000	464x464	97	4	1
20,000	304x304	47	3	1
30,000	224x224	31	3	1
40,000	176x176	22	3	1
50,000	144x144	17	3	1
60,000	128x128	14	3	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.

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-1 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-1.

Since the GX-1 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-1, 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.

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

7.2 Recorder

7.2.1 Memory

- 1) Installed Memory 2GB
- 2) With memory segments 256MB x 8, 512MB x 4, 1GB x 2, 2GB x 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. "×" indicates that settings cannot be combined.

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

Frame Size [pixel] Recording Speed [pps]	1280X1024	1280X960	1152X864	1024X1024	1280X720	928X928	1024X768	800X800	896X672
50	25.83	27.55	×	×	36.73	×	43.05	×	×
60	21.52	22.96	×	×	30.61	×	35.87	×	×
100	12.91	13.78	×	×	18.37	×	21.52	×	×
250	5.17	5.51	×	×	7.35	×	8.61	×	×
500	2.58	2.76	×	×	3.67	×	4.30	×	×
750	1.72	1.84	×	×	2.45	×	2.87	×	×
1000	1.29	1.38	×	×	1.84	×	2.15	×	×
1500	0.86	0.92	×	×	1.22	×	1.43	×	×
2000	0.65	0.69	×	×	0.92	×	1.08	×	×
2500	×	×	0.68	0.65	0.73	×	0.86	×	×
3000	×	×	×	×	×	0.66	0.72	×	×
4000	×	×	×	×	×	×	×	0.66	0.70
5000	×	×	×	×	×	×	×	×	×
6000	×	×	×	×	×	×	×	×	×
8000	×	×	×	×	×	×	×	×	×
10000	×	×	×	×	×	×	×	×	×
15000	×	×	×	×	×	×	×	×	×
20000	×	×	×	×	×	×	×	×	×
25000	×	×	×	×	×	×	×	×	×
30000	×	×	×	×	×	×	×	×	×
40000	×	×	×	×	×	×	×	×	×
50000	×	×	×	×	×	×	×	×	×
60000	×	×	×	×	×	×	×	×	×

Recording Times for Preset Settings (sec) (1024x576~464x464)

Frame size [pixel] Recording speed [pps]	1024X576	704X704	608X608	704X528	768X432	640X480	512X512	576X432	464X464
50	x	x	x	x	x	110.19	x	x	x
60	x	x	x	x	x	91.82	x	x	x
100	x	x	x	x	x	55.09	x	x	x
250	x	x	x	x	x	22.04	x	x	x
500	x	x	x	x	x	11.02	x	x	x
750	x	x	x	x	x	7.35	x	x	x
1000	x	x	x	x	x	5.51	x	x	x
1500	x	x	x	x	x	3.67	x	x	x
2000	x	x	x	x	x	2.75	x	x	x
2500	x	x	x	x	x	2.20	x	x	x
3000	x	x	x	x	x	1.84	x	x	x
4000	0.72	x	x	x	x	1.38	x	x	x
5000	x	0.68	x	x	x	1.10	x	x	x
6000	x	x	0.76	0.76	0.85	0.92	x	x	x
8000	x	x	x	x	x	x	0.81	0.85	x
10000	x	x	x	x	x	x	x	x	0.79
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

Recording Times for Preset Settings (sec) (512x384~176x176)

Frame size [pixel] Recording speed [pps]	512X384	368X368	384X288	304X304	320X240	256X256	224X224	256X192	176X176
50	x	x	305.96	x	440.47	x	x	x	x
60	x	x	254.97	x	367.06	x	x	x	x
100	x	x	152.98	x	220.24	x	x	x	x
250	x	x	61.19	x	88.09	x	x	x	x
500	x	x	30.60	x	44.05	x	x	x	x
750	x	x	20.40	x	29.36	x	x	x	x
1000	x	x	15.30	x	22.02	x	x	x	x
1500	x	x	10.20	x	14.68	x	x	x	x
2000	x	x	7.65	x	11.01	x	x	x	x
2500	x	x	6.12	x	8.81	x	x	x	x
3000	x	x	5.10	x	7.34	x	x	x	x
4000	x	x	3.82	x	5.51	x	x	x	x
5000	x	x	3.06	x	4.40	x	x	x	x
6000	x	x	2.55	x	3.67	x	x	x	x
8000	x	x	1.91	x	2.75	x	x	x	x
10000	0.86	x	1.53	x	2.20	x	x	x	x
15000	x	0.83	1.02	x	1.47	x	x	x	x
20000	x	x	x	0.92	1.10	x	x	x	x
25000	x	x	x	x	x	1.03	x	x	x
30000	x	x	x	x	x	x	1.12	1.15	x
40000	x	x	x	x	x	x	x	x	1.36
50000	x	x	x	x	x	x	x	x	x
60000	x	x	x	x	x	x	x	x	x

Recording Times for Preset Settings (sec) (192x144~8x64)

フレームサイズ 録画速度 [pixel] [pps]	192X144	144X144	128X128	128X96	96X96	64X64	32X64	8X64
50	x	x	x	x	x	x	x	x
60	x	x	x	x	x	x	x	x
100	x	x	x	x	x	x	x	x
250	x	x	x	x	x	x	x	x
500	x	x	x	x	x	x	x	x
750	x	x	x	x	x	x	x	x
1000	x	x	x	x	x	x	x	x
1500	x	x	x	x	x	x	x	x
2000	x	x	x	x	x	x	x	x
2500	x	x	x	x	x	x	x	x
3000	x	x	x	x	x	x	x	x
4000	x	x	x	x	x	x	x	x
5000	x	x	x	x	x	x	x	x
6000	x	x	x	x	x	x	x	x
8000	x	x	x	x	x	x	x	x
10000	x	x	x	x	x	x	x	x
15000	x	x	x	x	x	x	x	x
20000	x	x	x	x	x	x	x	x
25000	x	x	x	x	x	x	x	x
30000	x	x	x	x	x	x	x	x
40000	1.53	x	x	x	x	x	x	x
50000	x	1.63	x	x	x	x	x	x
60000	x	x	1.72	2.28	x	x	x	x

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.

7.3 Video Converter

- 1) Output Signal
Image update rate
Display area
NTSC / PAL method analog signal, 75 Ω , 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
LOW, NORMAL, HIGH
AUTO, 3100K, 5000K, 9000K, REG
OFF, LOW, NORMAL, HIGH
OFF, LOW, NORMAL
0%, 50%, 100%, 150%, 200%
OFF, ON
- 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
- 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	Device connected
OFF	Device not connected or power OFF

7.4.2 Video Output On Screen Display

- 1) Mode display LLIGHT (LOW LIGHT), STOP, VIEW, ARM, REC, FAIL
- 2) Recording speed 50~200,000 (pps units in integers), EST
- 3) Shutter 1/100~1/20K, 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

7.4.3 Remote Control JPAD3

System controller settings and verification can be made with the remote control JPAD3.

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 / PRIORITY 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)
- AE Automatic exposure OFF/ON and brightness settings, OFF, LOW, NORMAL, HIGH
- AE AREA Automatic exposure measurement area settings, FULL, CENTER, UPPER, LOWER, LEFT, RIGHT
- 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
- 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
- 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
- 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)

• 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), EST1, EST2
• 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. If the REC MODE in the trigger setting menu is used to set modes with (A)(L)(C) other than NORMAL, EVENT, BURST, it has priority, and this function does not work.
• 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
• TRIG SET	Trigger settings menu
/ TRIG SEL	Trigger signal selection, TRIG1 (J1 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)
	Above, AUTO is abbreviated as (A), and is an automatic segment switch and save in all segments, LOOP is abbreviated as (L), and is an automatic segment switch and overwrite in the memory segments. Only the STOP command stops LOOP. (C) is an abbreviation of CONTINUATION. Modes with (A) (L) (C) have priority over the AUTO VIEW function.
/ BLOCKS	Multi trigger block settings, 1~16
• SIG SET	Input/output signal settings menu
/ TRIG1	J1 trigger input polarity settings, POSI(rising), NEGA (falling edge)
/ TRIG2	J3 trigger input polarity settings, CRNTON (current ON), CRNTOFF(current OFF)
/ EST1	J1 EST1 input polarity settings, POSI(rising), NEGA (falling edge)
/ 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)
/ ARM CMD	J2 ARM command input polarity settings, POSI(rising), NEGA (falling edge)

/ ARM STS	J1 ARM status output polarity settings, POSI(ARM during H), NEGA (ARM during L)
/ FAULT	J1 FAULT status output polarity settings, POSI(FAULT during H), NEGA (FAULT during L)
• SYS SET	System settings menu
/ SEG SIZE	Memory segment settings, 1 ~16
/ 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
 - 4GB 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 J1 Connector

- 1) Connector

ID color	Yellow
Name	POWER
Connector name	LEMO EGG.2B.310
Plug name	LEMO FGG.2B.310
- 2) Input Power

Power voltage	DC20—32V
Input power	DC power (AC adapter) or the included battery
Power consumption	Approximately 39W (ARM mode, DC24V, when not connected to a peripheral device)
Power protection	
Reverse polarity	internal fuse (replaceable by user)
Excess charge	35VDC, 1 minute

With remote power control function (Refer to 【7.5.3】)
- 3) EST1 Input

Signal level	TTL level, 5V pull up resistance 4700 Ω , insulation L level : - 0.5VDC (minimum applied voltage) ~0.8VDC H level : 2VDC~5.5VDC(maximum applied voltage)
Function	Exposure starts H→L, photographs one image Synchronization delay 1.5 μ sec or less. Reverse polarity function.

Refer to APPENDIX B for details.
- 4) TRIG1 Trigger Input

Signal level	TTL level, 5V pull up resistance 4700 Ω , 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.
- 5) ARM Status Output

Signal level	Open collector output, insulation Maximum applied voltage 50VDC, maximum current 100mA
Function	Short circuit in the ARM mode. Reverse polarity function.

Refer to APPENDIX D for details.
- 6) FAULT Status Output

Signal level	Open collector output, insulation Maximum applied voltage 50VDC, maximum current 100mA.
Function	Short circuit with FAULT status. Reverse polarity function.

Refer to APPENDIX D for details.

7.5.2 J2 Connector

- 1) Connector
ID color Green
Name VF & J-PAD
Connector name LEMO EGG.2B.316
Plug name LEMO FGG.2B.316
- 2) ARM Command Input
Signal level TTL level, 5V pull up resistance 4700 Ω , insulation
L level : - 0.5VDC (minimum applied voltage) ~0.8VDC
H level : 2VDC~5.5VDC (maximum applied voltage)
Function H→L for ARM mode. Reverse polarity function.
Refer to APPENDIX D for details.
- 3) DC24V Output
Signal level Power input through output
No protective circuit, maximum output current : 1A
- 4) VIDEO Output
Method NTSC / PAL
Signal level 1V(p-p), 75 Ω , no insulation
- 5) USB
Standard USB 2.0 Standard, insulation
- 6) RS232
Standard RS-232C Standard, no insulation, but only with TXD and RXD.
Function For JPAD3(remote controller) connection

7.5.3 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
- 3) EST2 / EVENT Input
Signal level TTL level, 5V pull up resistance 4700 Ω , 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 1.5 μ sec 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 1500 Ω , maximum applied voltage \pm 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.
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.

7.5.4 Pin Numbers

- 1) J1 Connector
- | | |
|-------|----------------------|
| 1 | DC24V IN |
| 2 | DC24V RTN |
| 3 | EST1 IN |
| 4 | EST1 IN RTN |
| 5 | TRIG1 IN |
| 6 | TRIG1 IN RTN |
| 7 | ARM status out |
| 8 | ARM status out RTN |
| 9 | FAULT status out |
| 10 | FAULT status out RTN |
| shell | FRAME GND |
- 2) J2 Connector
- | | |
|-------|------------------------------|
| 1 | ARM command IN |
| 2 | ARM command IN RTN |
| 3 | USB VBUS |
| 4 | USB D- |
| 5 | USB D+ |
| 6 | USB GND |
| 7 | NC |
| 8 | NC |
| 9 | DC24V OUT (Viewfinder power) |
| 10 | DC24V OUT RTN |
| 11 | VIDEO OUT (NTSC/PAL signal) |
| 12 | VIDEO OUT RTN |
| 13 | TXD OUT (REMOCON RS-232C) |
| 14 | RXD IN (REMOCON RS-232C) |
| 15 | DC24V OUT (REMOCON power) |
| 16 | TXD, RXD RTN |
| shell | FRAME GND |
- 3) J3 Connector
- | | |
|-------|------------------------------------|
| 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 (Connector)
- 3) Vibration MIL-STD-810C METHOD 514.2 CATEGORY b2 standard
(RANDOM VIBRATION ENVELOPE) FIGURE 514.2-2A
- 4) Shock Half-sine, 11msec, 100G
A G-resistant lens is required. Sold separately.

7.7 Shape

- 1) Exterior dimensions Approximately W100 x H100 x D230mm (excluding connector, protruding parts, options, F-mount and tripod plate)
- 2) Weight 4GB Model : Approximately 3.54 kg
(excluding F-mount, tripod plate, cables, handle, and options)
Handle (including screws) Approximately 0.07kg
Tripod plate (including screws) Approximately 0.23kg
F-mount (including screws) Approximately 0.21kg
C-mount (including screws) Approximately 0.07kg (option)
- 3) Tripod mounting screw 3/8-16UNC (large screw) DEPTH 8mm (for tripod plate use)
- 4) G-resistant mounting screw M6, DEPTH 7mm, 6 screws

7.8 Adaptive Standards

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 Specifications of the Main Attachments

7.11.1 AC Adapter (no G-resistant function)

- | | |
|---------------------------------------|---|
| 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 | Yes, with guard |

Note) Ground the AC 3 pin connector. If not grounded, electrical shock may occur when the camera or GX-HUB is touched.

7.11.2 Control Software

- | | |
|-----------------------|---|
| 1) Platform | Windows 2000/XP Professional |
| 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, TIFF, JPG, BMP |
| 6) Other files | FCV(conversion settings), TXT(scene information),
CSV(analog waves, measurement data) |

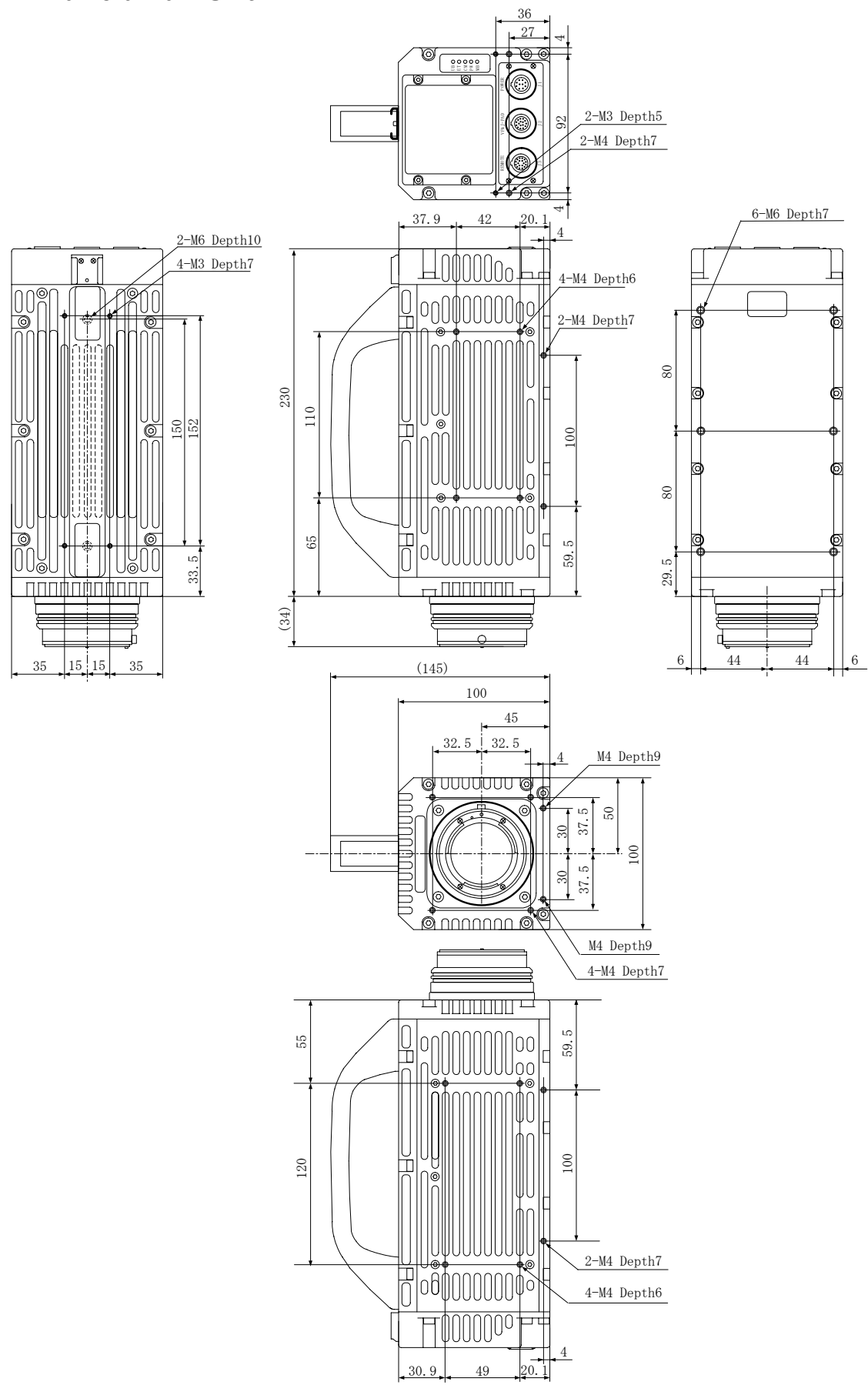
Note) The optional external signal storage unit is required for analog waveforms

7.11.3 Cables

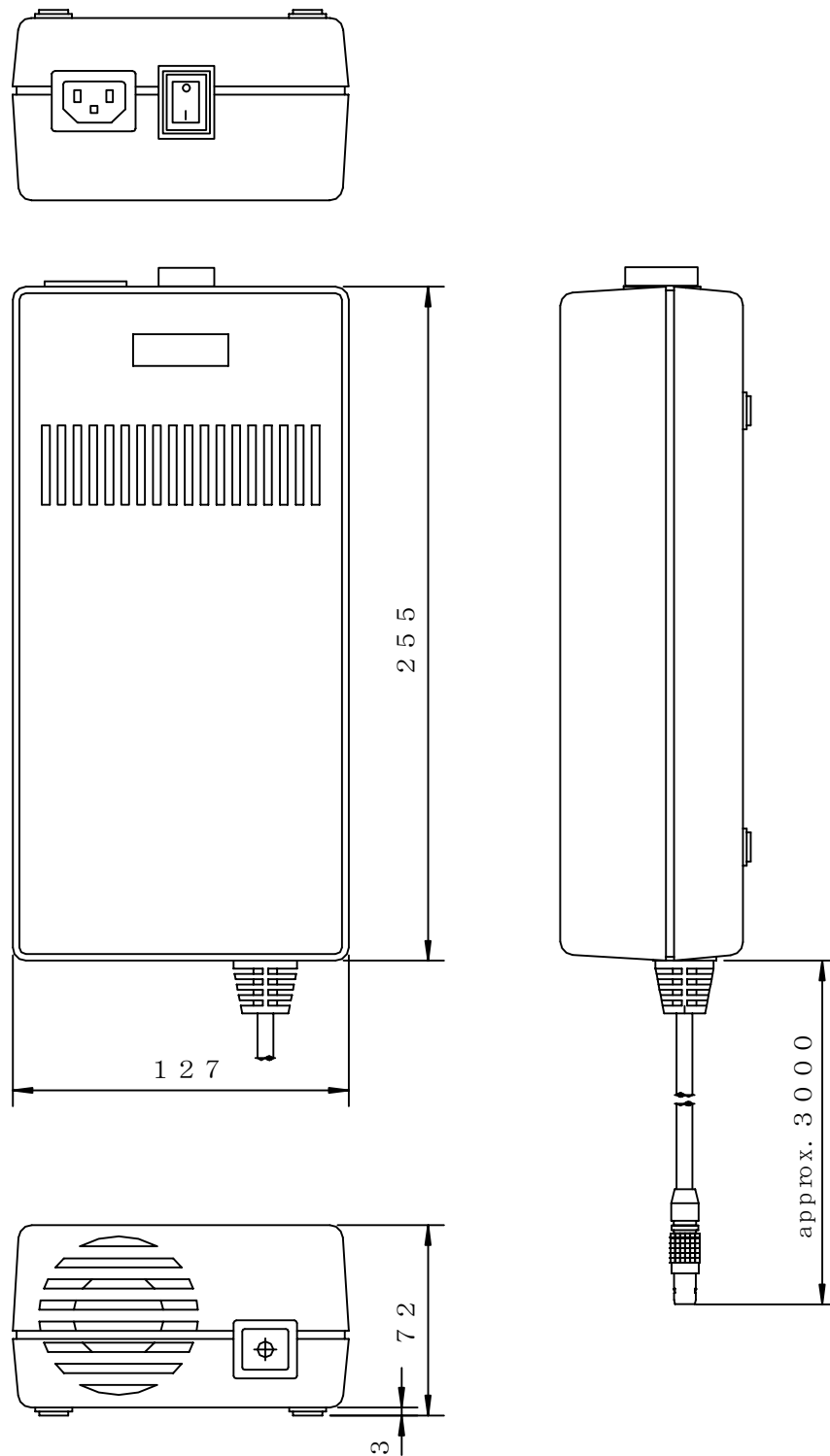
- | | | | |
|--------------------|-------------|---------------------|------------------------|
| 1) Simple J1 Cable | | | |
| P1 | Camera plug | (ID color : yellow) | LEMO FGG.2B.310 |
| P10 | POWER | Power input | LEMO PHG.1B.303 |
| P12 | TRIG1 | Trigger 1 input | BNC plug |
| 2) Simple J2 Cable | | | |
| P2 | Camera plug | (ID color : green) | LEMO FGG.2B.316 |
| P21 | USB | USB | USB series A plug |
| P22 | VF | Viewfinder | Hirose HR10A-7P-6S(73) |
| P23 | JPAD | JPAD3 | LEMO PHG.OB.306 |
| 3) Simple J3 Cable | | | |
| P3 | Camera plug | (ID color : blue) | LEMO FGG.2B.318 |
| P31 | ETHER | ETHERNET | RJ45 plug |

7.12 Exterior Diagram

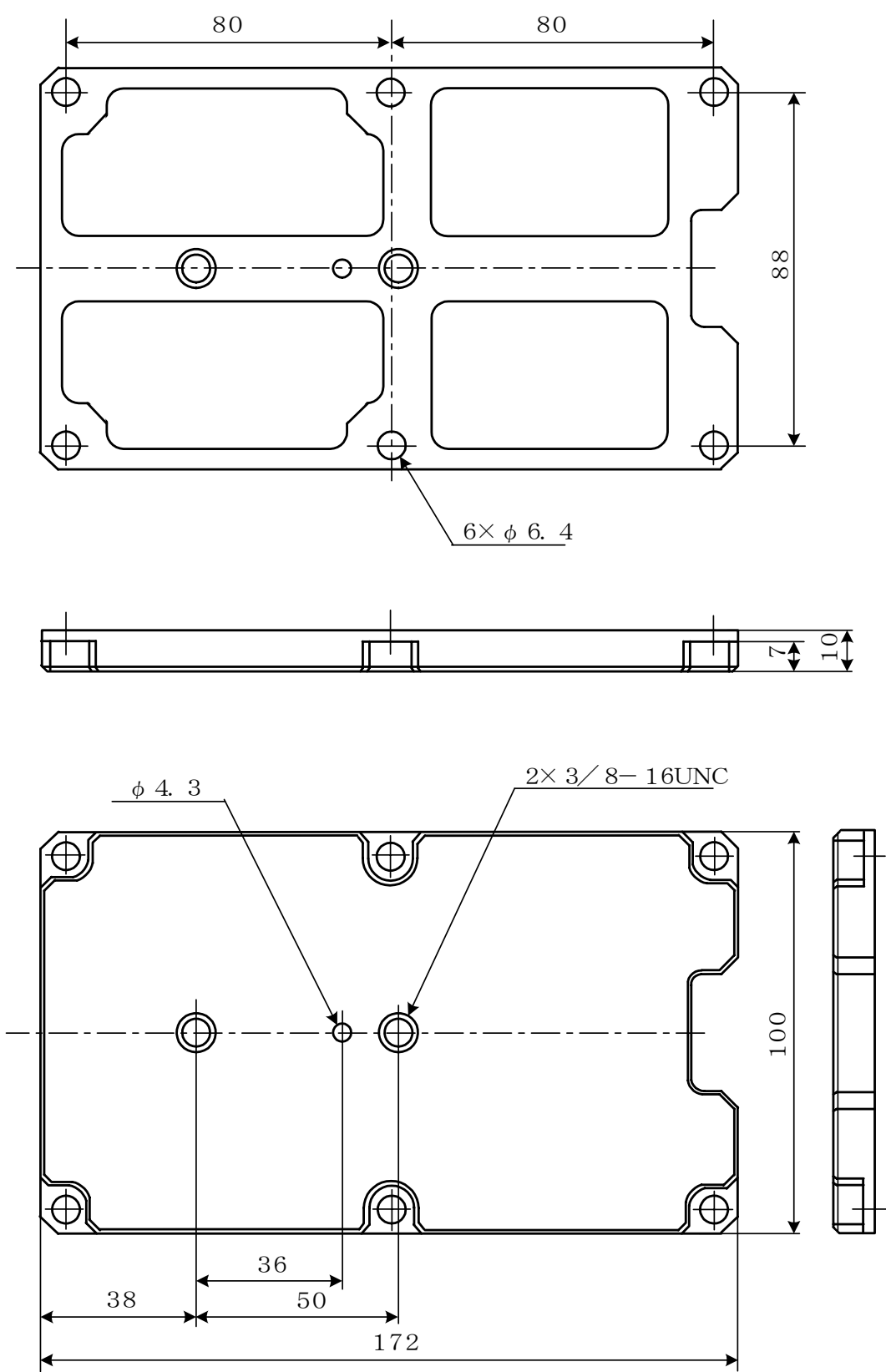
7.12.1 Camera Main Unit



7.12.2 AC Adapter



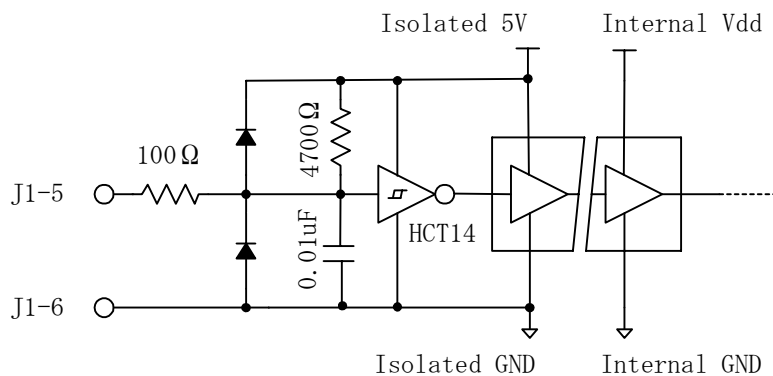
7.12.3 Tripod Plate



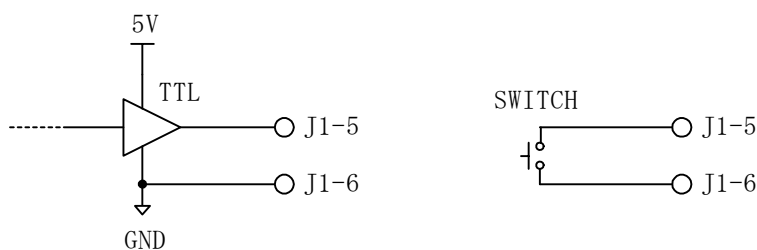
APPENDIX A Trigger

A1. TRIG1

- Equivalent Circuit Diagram for Input



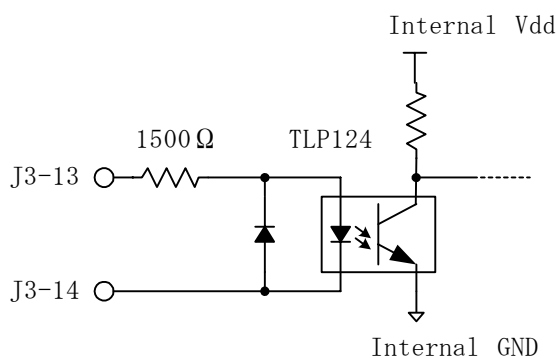
- Hypothesized Interface Circuit



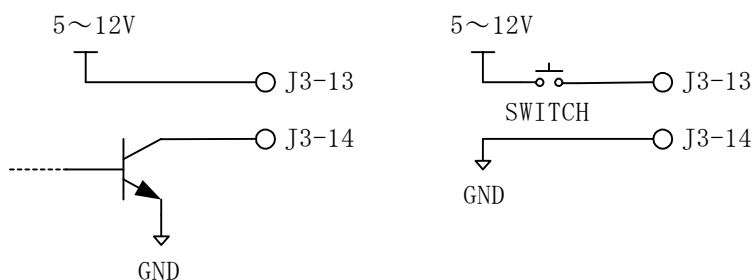
A2. TRIG2

- Equivalent Circuit Diagram for Input

Reference Value : The input pulse width must be approximately $10\mu\text{sec}$ or more with CRNTON, and approximately $350\mu\text{sec}$ or more with CRNTOFF.



- Hypothesized Interface Circuit



A3. Trigger Filter

A digital noise filter circuit is included so if there is a high level of external noise, set the filter value higher to increase the filter efficiency.

The units for the filter values are μ sec, and there is a delay when clean pulses without chattering are input. The minimum setting for the units is 0.1μ sec. The factory setting is 200.0μ sec and the range of settings is $0.0\sim 6553.5 \mu$ sec.

This filter value can be applied to two trigger inputs.

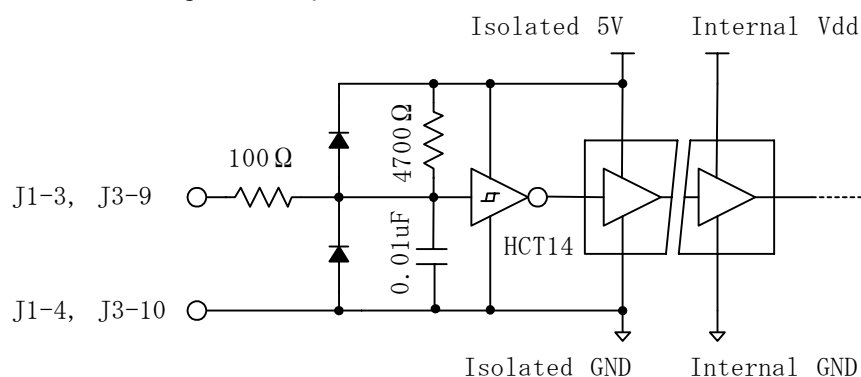
There is generally a delay of approximately 1.4μ sec added to the J1 connector TRIG1 trigger input due to the analog filter on the input part. Also, the J1 connector trigger input is driven by the contact point or the open collector, and if the EST polarity is positive, the delay of approximately 1.4μ sec increases to approximately 30μ sec.

J3 connector TRIG2 delay is approximately 5μ sec with the CRNTON trigger and approximately 150μ sec with the CRNTOFF trigger.

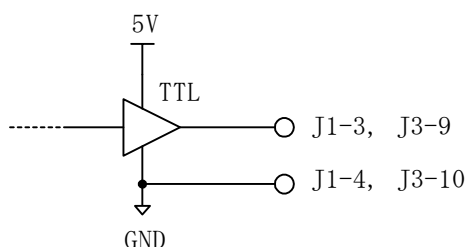
APPENDIX B Exposure Start Signal (EST) and Event Signal

B1. EST1, EST2 / EVENT

- Equivalent Circuit Diagram for Input



- Hypothesized Interface Circuit



B2. EST Filter

A digital noise filter circuit is included so if there is a high level of external noise, set the filter value higher to increase the filter efficiency.

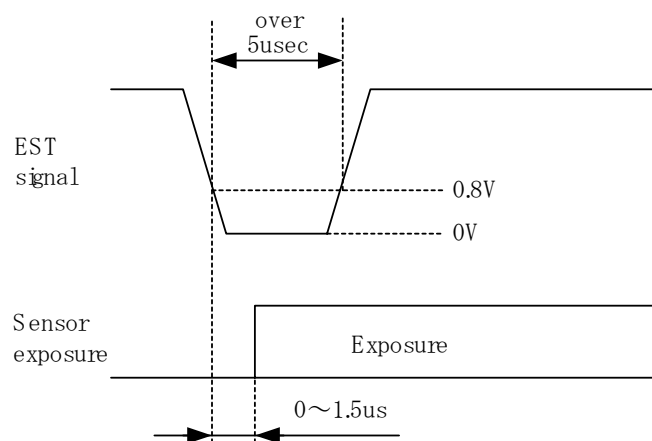
The units for the filter values are μ sec, and there is a delay when clean pulses without chattering are input. The minimum setting for the units is 0.1μ sec. The factory setting is 0μ sec and the range of settings is $0.0 \sim 6553.5 \mu$ sec.

This filter value can be applied to two EST inputs.

There is generally a delay of approximately 1.4μ sec added due to the analog filter on the input part. Also, since it is driven by the contact point or the open collector, and if the trigger polarity is positive, the delay of approximately 1.4μ sec increases to approximately 30μ sec.

B3. Timing

A timing diagram is shown when the noise filter value is 0μ sec.



B4. Timing Restrictions

There are restrictions on the maximum recording speed such that

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

must apply. If this is not met, proper recording is not possible.

Additionally, there are restrictions on the shutter speed such that

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

must apply. If this is not met, proper recording is not possible.

B5. 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.

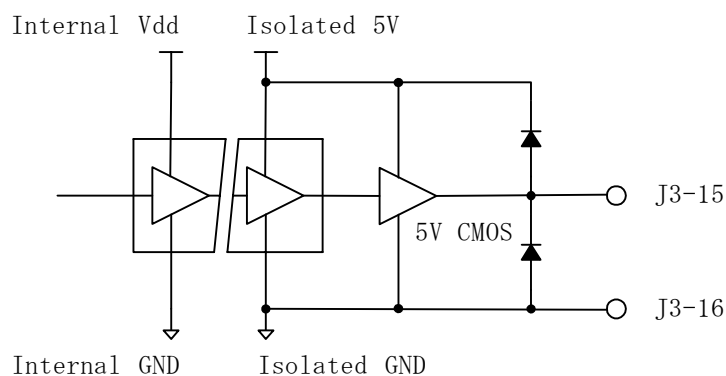
There is no jump function.

This can be used in conjunction with the event trigger function.

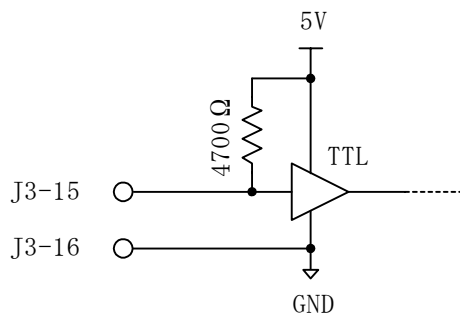
APPENDIX C Exposure Pulse Output (EPO)

C1. EPO

- Equivalent Circuit Diagram for Input

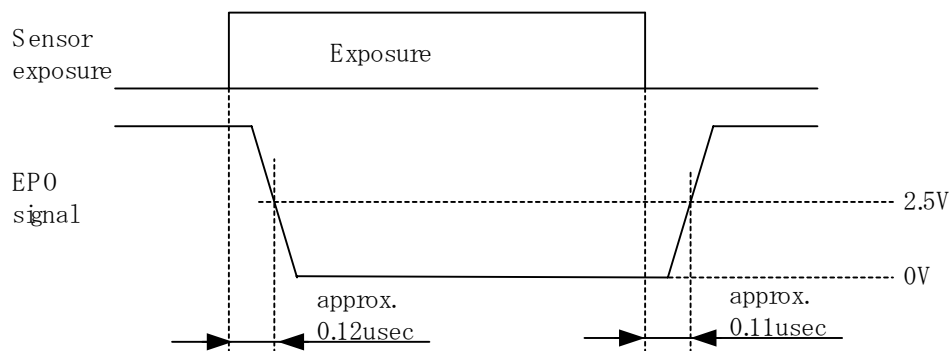


- Hypothesized Interface Circuit (without external noise)



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.

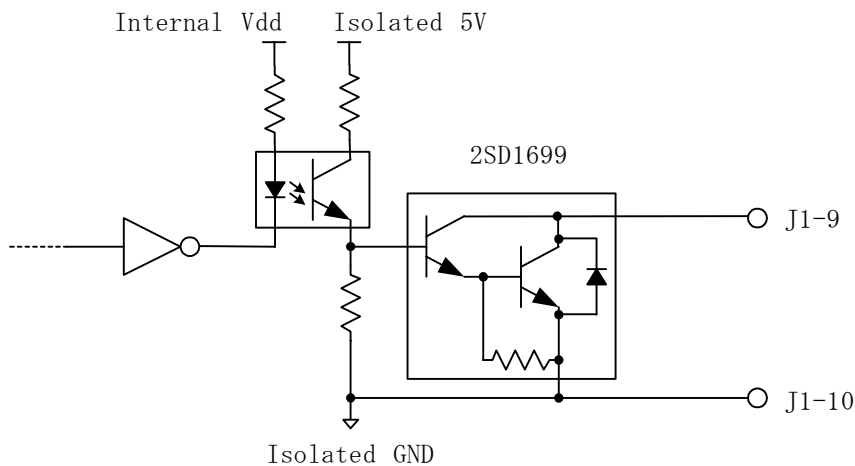
C4. Precautions

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.

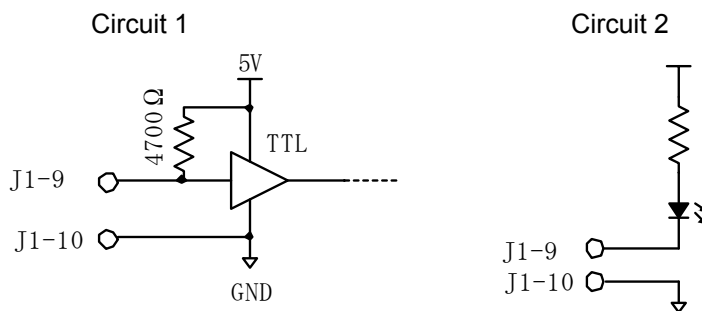
An incorrect pulse may be detected with the wrong method of use, and transmission may not be possible due to the elimination of pulses.

D2. FAULT Status Output

• Equivalent Circuit Diagram for Input



• Hypothesized Interface Circuit



• Example of Method Used

Circuit 1 of the hypothesized interface circuit is a circuit where the FAULT status is detected as a logic signal.

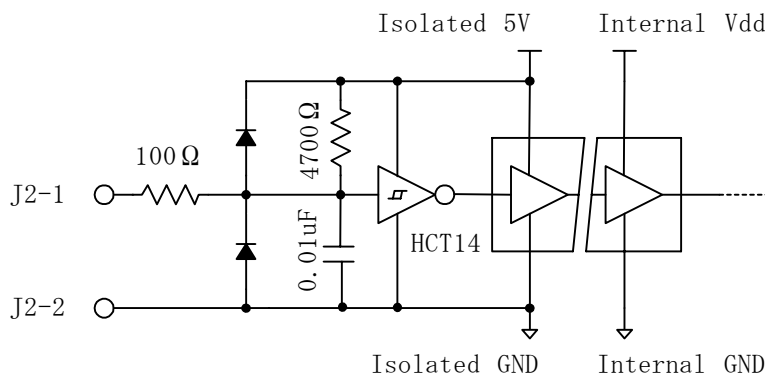
Circuit 2 is a circuit that visually checks the FAULT status in the LED display. Set FAULT to output the L level to light FAULT.

To detect if multiple cameras are in FAULT use circuit 1, connect the FAULT status output for all of the cameras (wired NOR) and set FAULT to output the L level. If all of the cameras are not in FAULT, it switches to H level.

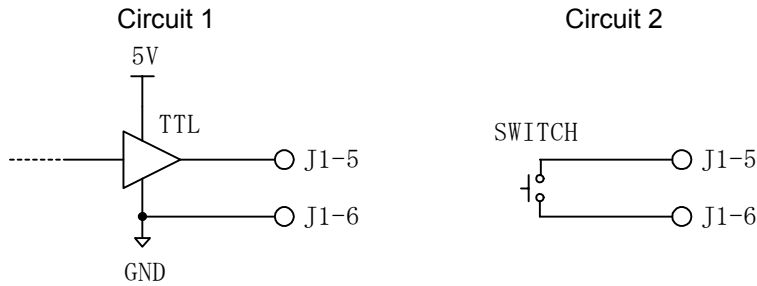
Take note that when the camera power is OFF, the output is at H.

D3. ARM Command Input

• Equivalent Circuit Diagram for Input



- Hypothesized Interface Circuit



- Example of Method Used

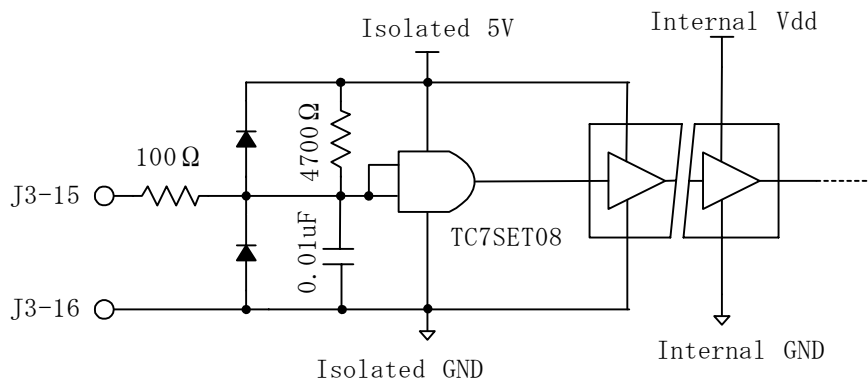
Circuit 1 of the hypothesized interface circuit is a circuit where the command is input in logic signals. The logic level can be set to H / L.

Circuit 2 is a circuit that inputs commands in contact signals. Commands must be set to the L level. To ARM multiple cameras simultaneously, the ARM command must be connected to all of the cameras with a single signal.

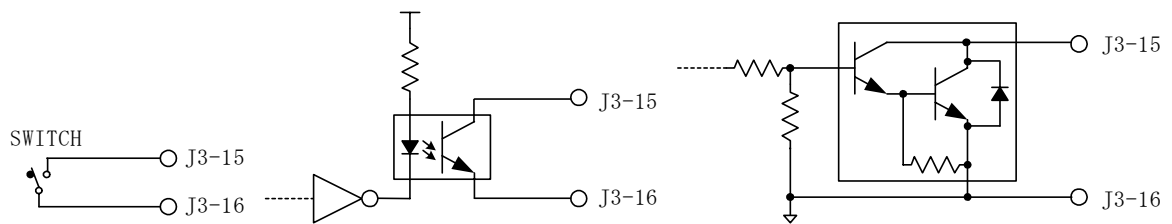
If the ARM command signal is not connected (open state), note that it will be at the H level.

D4. Power Control Input

- Equivalent Circuit Diagram for Input



- Hypothesized Interface Circuit



- 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.

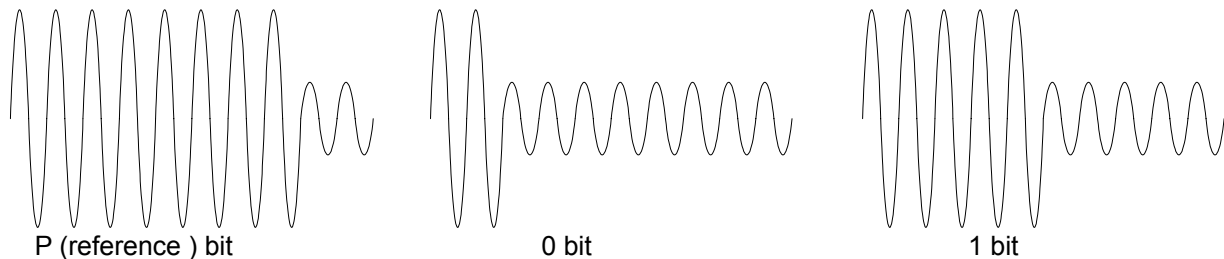
APPENDIX E IRIG-B

E1. Standard : IRIG Standard 200-98, IEEE1344

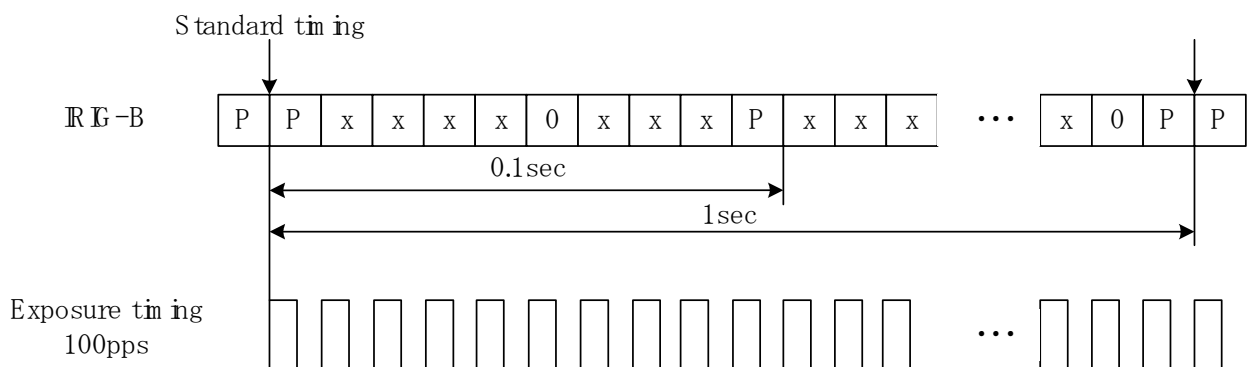
Compatible with 1kHz carrier modulation IRIG-B (B120, B122, B123 format).
Not compatible with unmodulated IRIG-B (B000, B003 format).

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 1280 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 $2,000 \times 4 = 8,000$ pps.

2,000 frames/sec involves a frame interval of 500μ sec so each camera shifts only 0μ sec, 125μ sec, 250μ sec, and 375μ sec 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° .

8

Options

8.1 Specifications of the Main Options

8.1.1 JPAD3 (no G-resistant function)

- 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
- 6) Connector Plug : LEMO FGG.0B.306
- 7) Cable Pigtail, length approximately 2.9m
- 8) Transmission RS-232C, 38400 bps
- 9) Operation part Operation button, dial, lock switch, LED display
- 10) LCD display 128 x 64dot, monochrome, back light

8.1.2 Cables

- 1) J1 Branch Cable

P1	Camera Plug	(ID color : yellow)	LEMO FGG.2B.310
P10	POWER	Power input	LEMO PHG.1B.303
P11	EST1	EST1 input	BNC plug
P12	TRIG1	Trigger1 input	BNC plug
P13	ARM-O	ARM Status output	BNC plug
P14	FAULT	FAULT Status output	BNC plug
- 2) J2 Branch Cable

P2	Camera Plug	(ID color : green)	LEMO FGG.2B.316
P20	ARM-I	ARM command input	BNC plug
P21	USB	USB	USB series A receptacle
P22	VF	Viewfinder	Hirose HR10A-7P-6S(73)
P23	JPAD	JPAD3	LEMO PHG.OB.306
- 3) 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

8.1.3 5.7 inch LCD Viewfinder (No G-resistant function)

- 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, 30~80%RH(no condensation)
- 4) Exterior dimensions Approximately W155 x H117 x D35 mm
- 5) Weight Approximately 600 g
- 6) Video method NTSC / PAL automatic conversion
- 7) LC panel 5.7 inch, TFT,
- 8) Resolution 640 x 480
- 9) Luminance 400 cd/m²
- 10) Angle of view 65 / 65°(left / right), 65 / 40°(top / bottom)
- 11) Connector Power and video supplied from the main camera unit
using Hirose HR10A-7R-6P
BNC Loop through Output (automatic terminal)

8.1.4 Main Unit with Battery (G-resistant model)

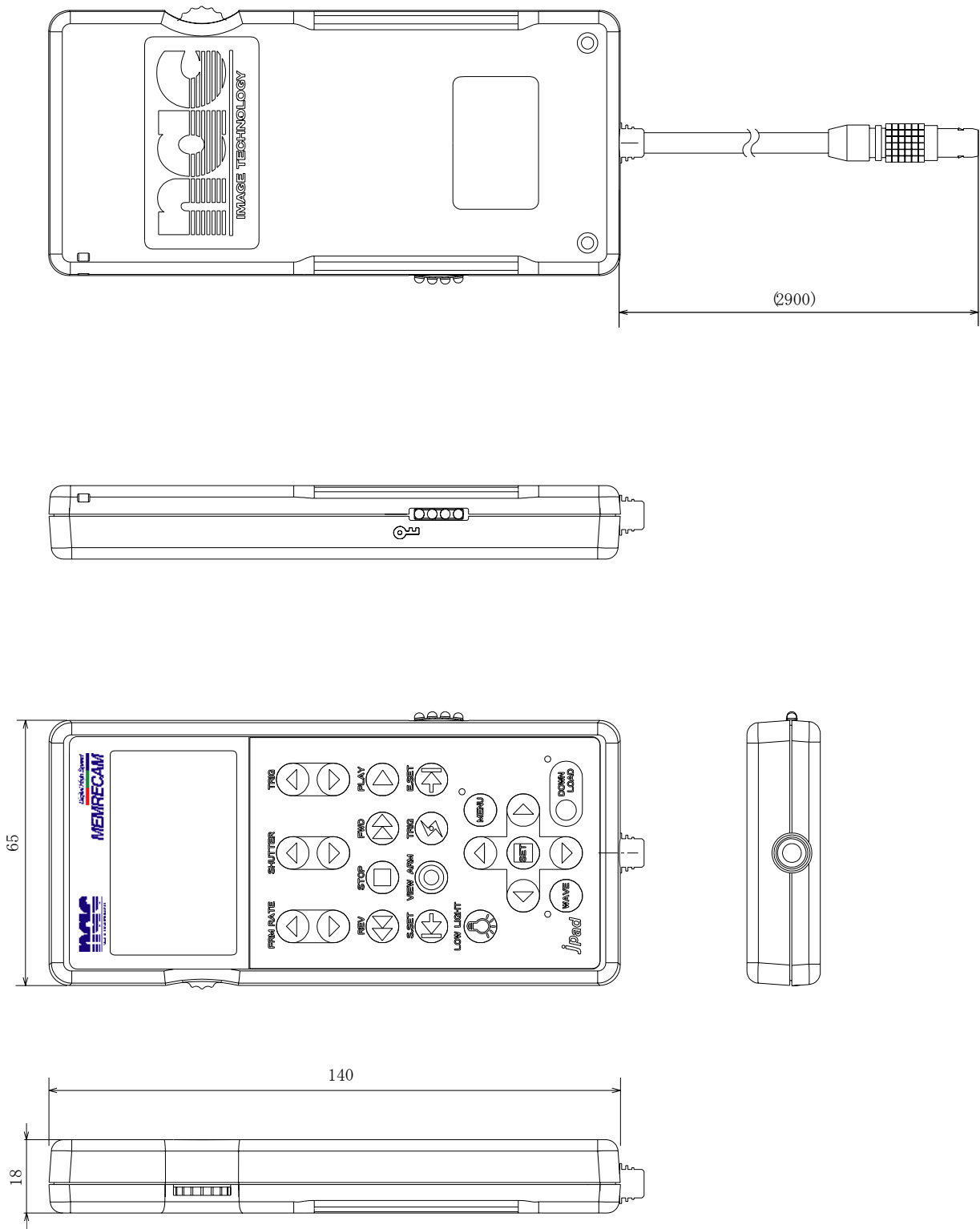
- 1) Input (DC IN) DC22~32 V, DC power (AC adapter)
Connector : LEMO EGG.1B.303
- 2) Input (CHARGER IN) Connect to special charger to charge battery
Connector : LEMO EGG.1B.304
- 3) Output Nominal output DC24V, with power switch
Connector : LEMO FWG.1B.303
- 4) Battery Nickel hydrogen, 3 x 20, nominal 2.7Ah, Life 1 year
- 5) Exterior dimensions Approximately W160 x H45.5 x D257 mm (not including connector)
- 6) Weight Approximately 2.94 kg
- 7) Operating temperature and humidity
0~+40°C, 20~80%RH, no condensation
- 8) Storage temperature and humidity
-10~+60°C, 20~80%RH, no condensation
- 9) Vibration MIL-STD-810D METHOD 514.3 CATEGORY1 standard
(common carrier environment) FIGURE514.3-1 to 514.3-3
- 10) Shock Half-sine, 11msec, 100G
- 11) Camera operating time 50min or more in ARM

8.1.5 GX-HUB (G-resistant model)

- 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
-10~+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

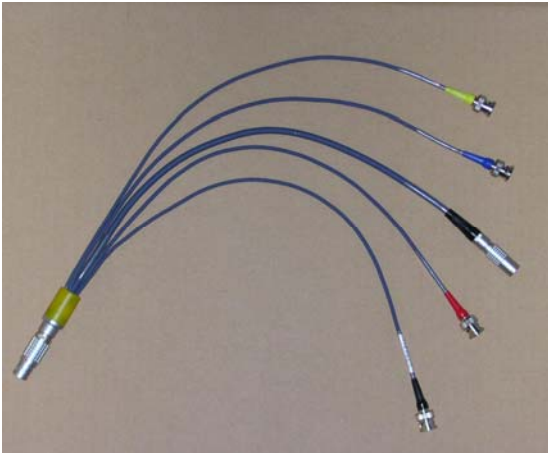
8.2 Exterior Diagram

8.2.1 JPAD3

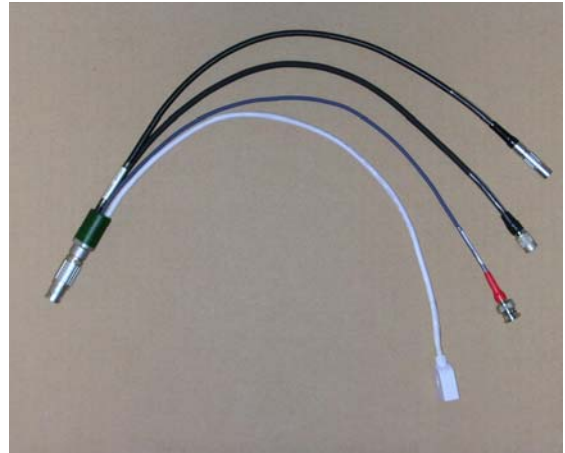


8.2.2 Cables

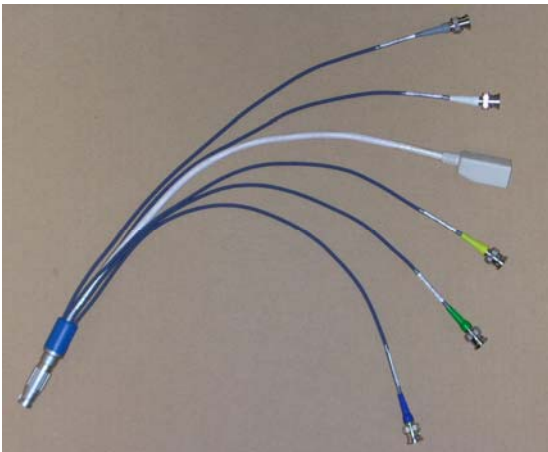
J1 branch cable



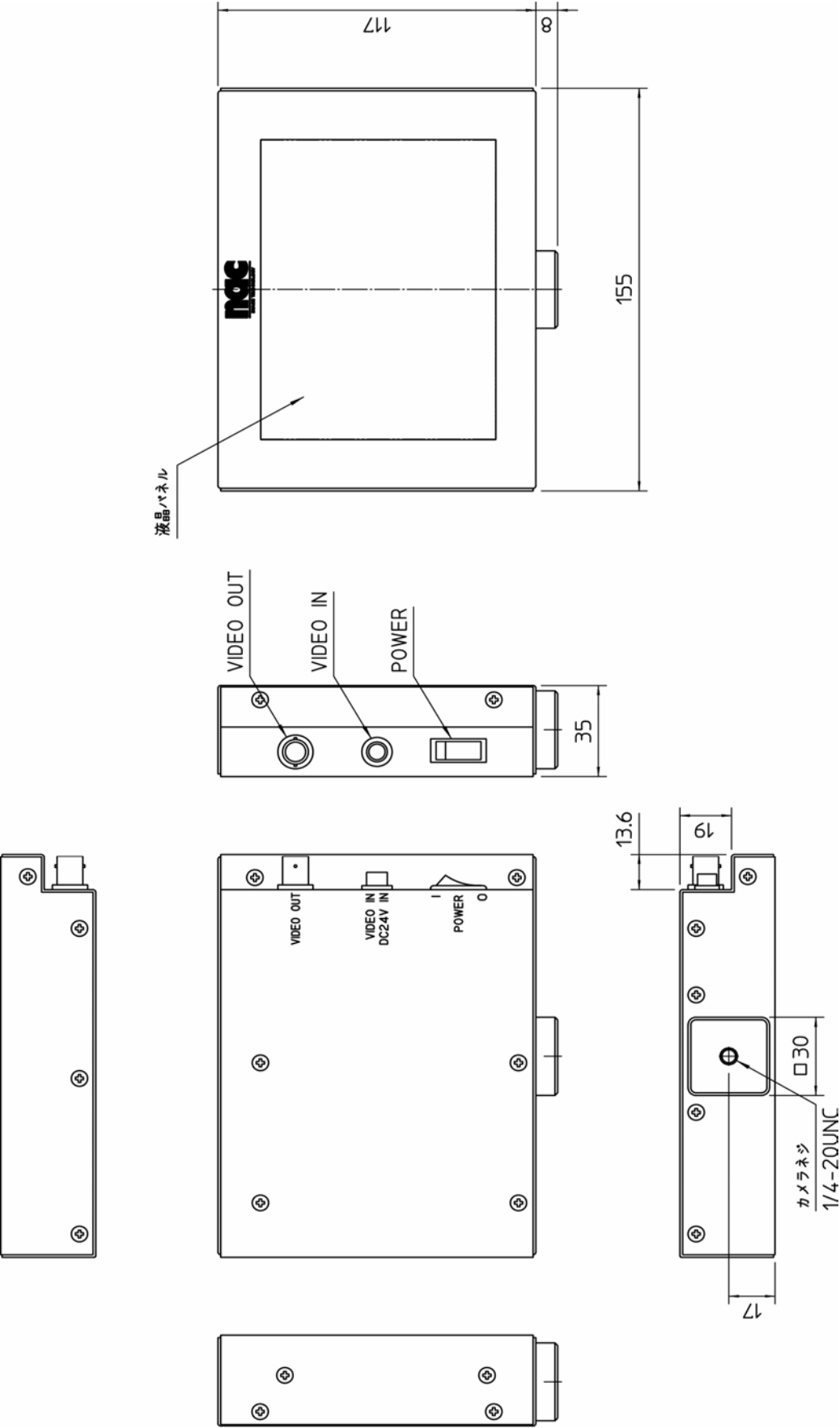
J2 branch cable



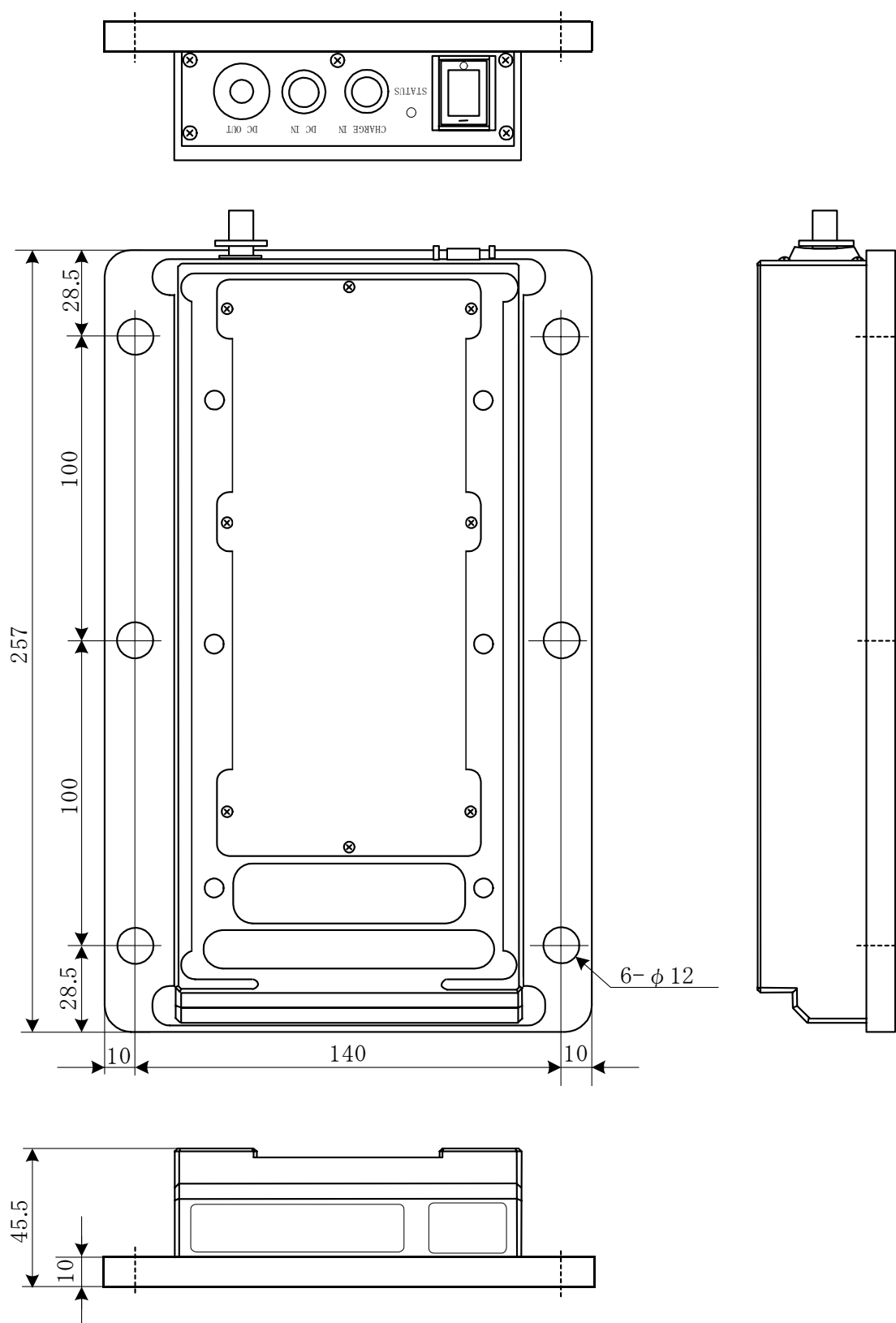
J3 branch cable



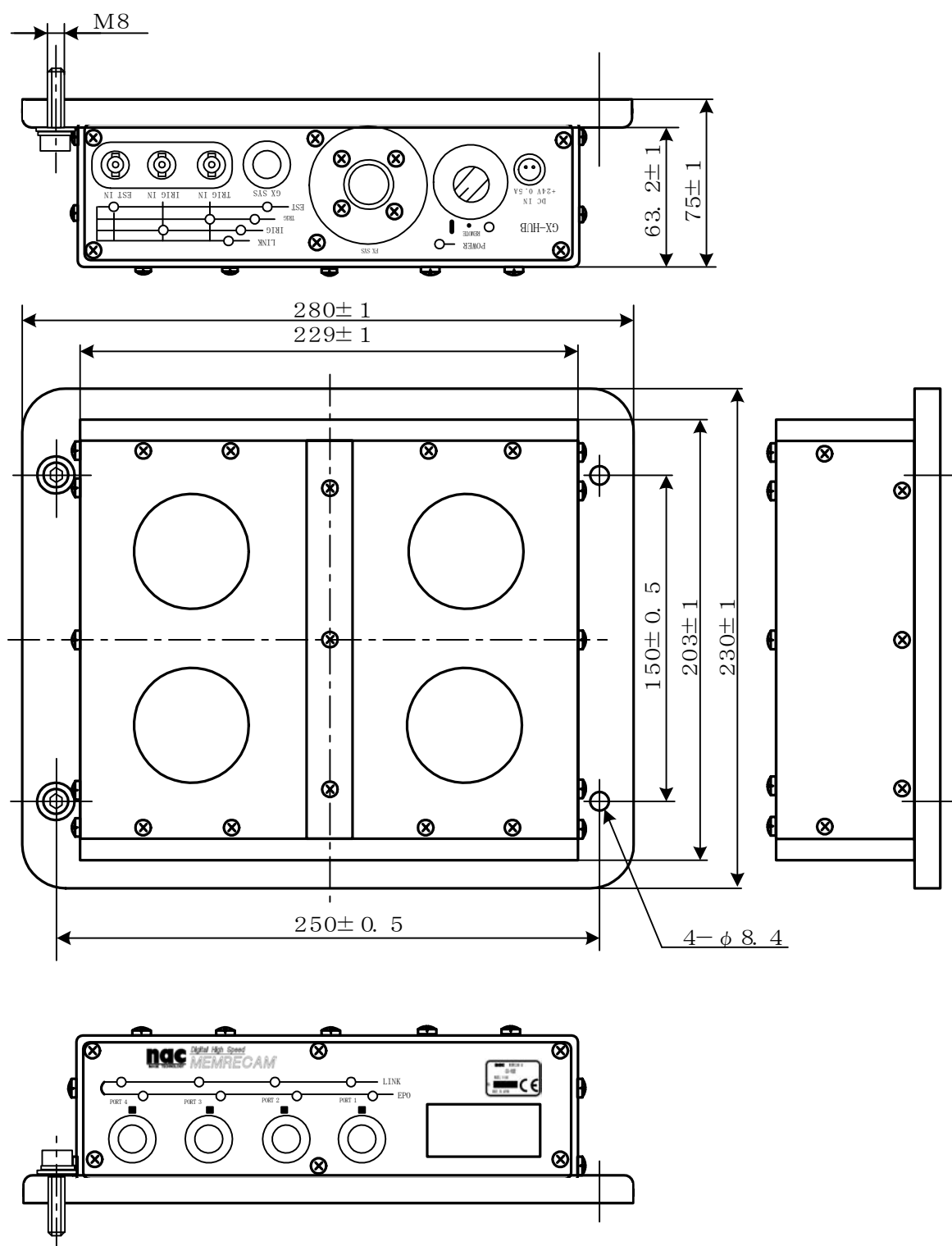
8.2.3 5.7 inch LCD Viewfinder



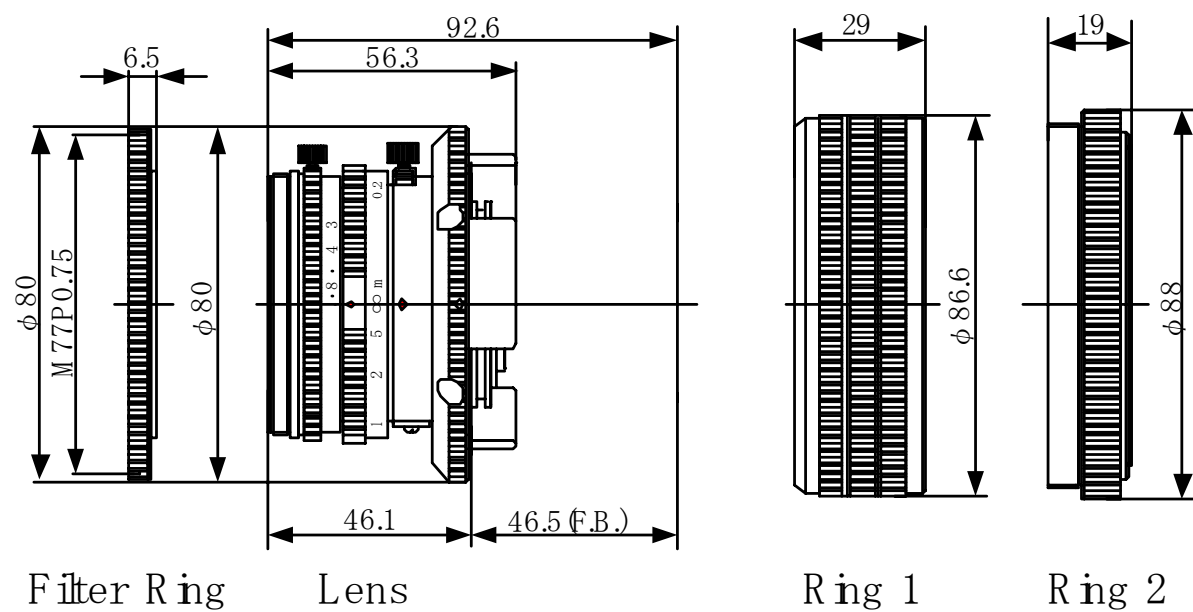
8.2.4 Battery for the Main Unit



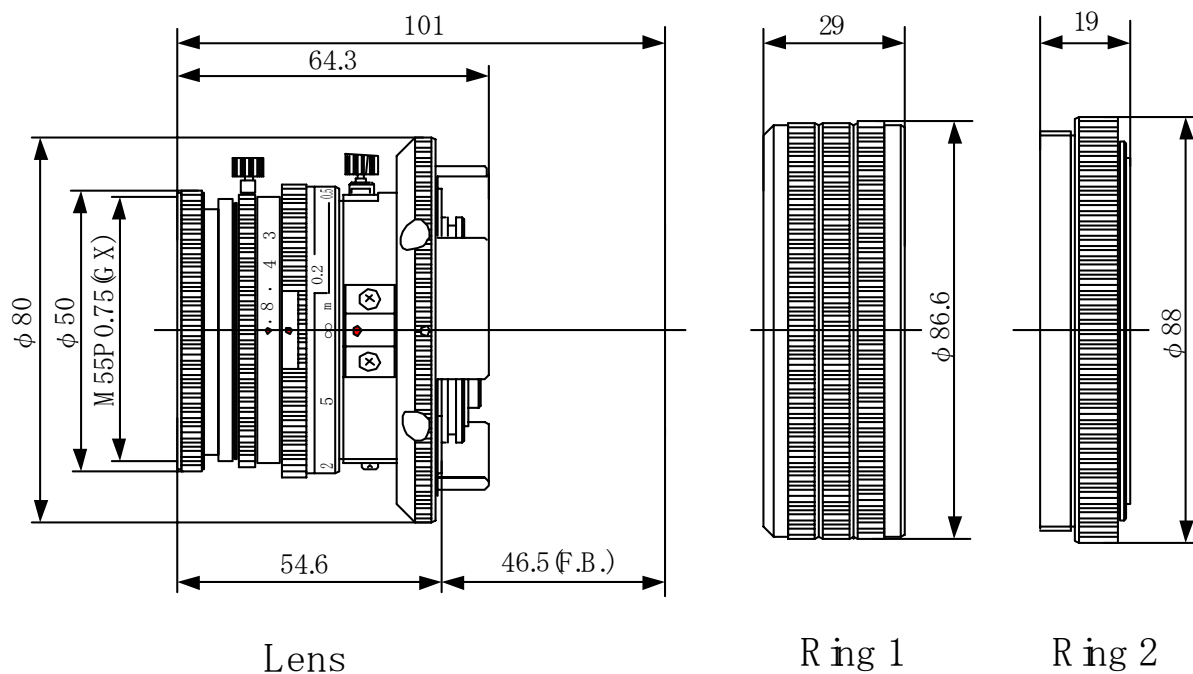
8.2.5 GX-HUB



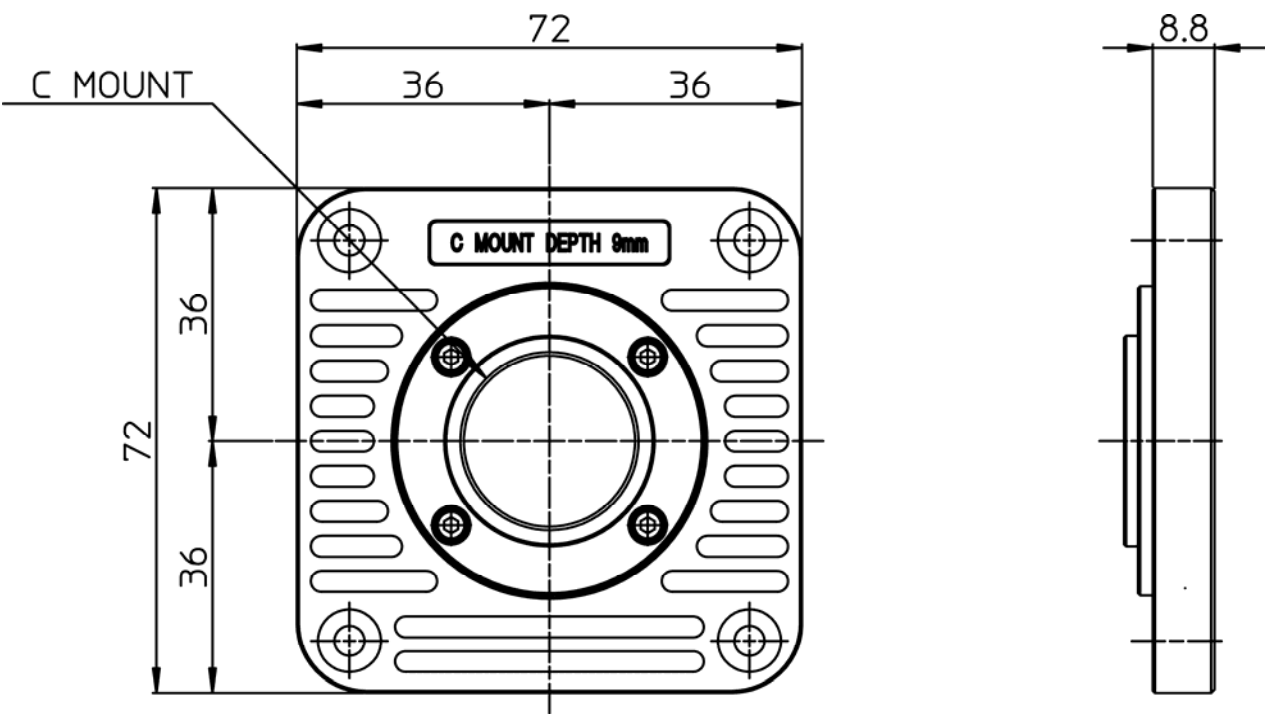
8.2.6 G-resistant F-mount lens f=16mm



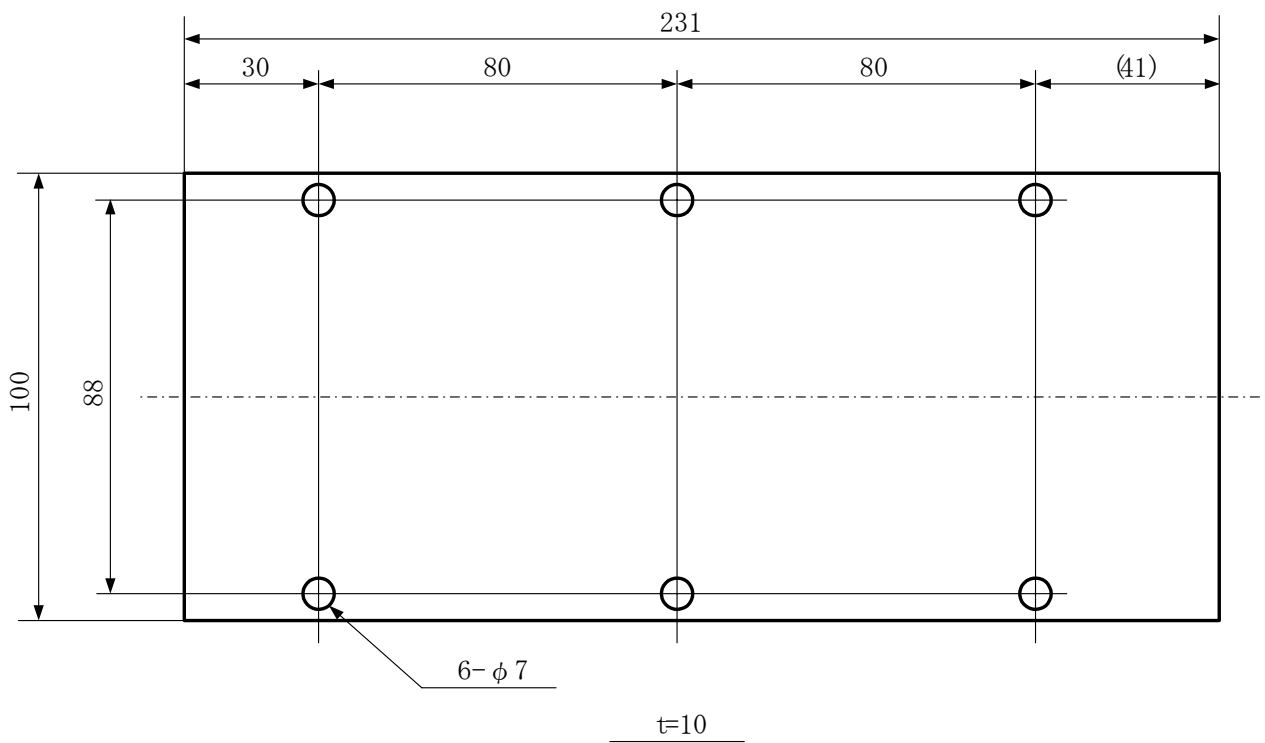
8.2.7 G-resistant F-mount lens f=21mm



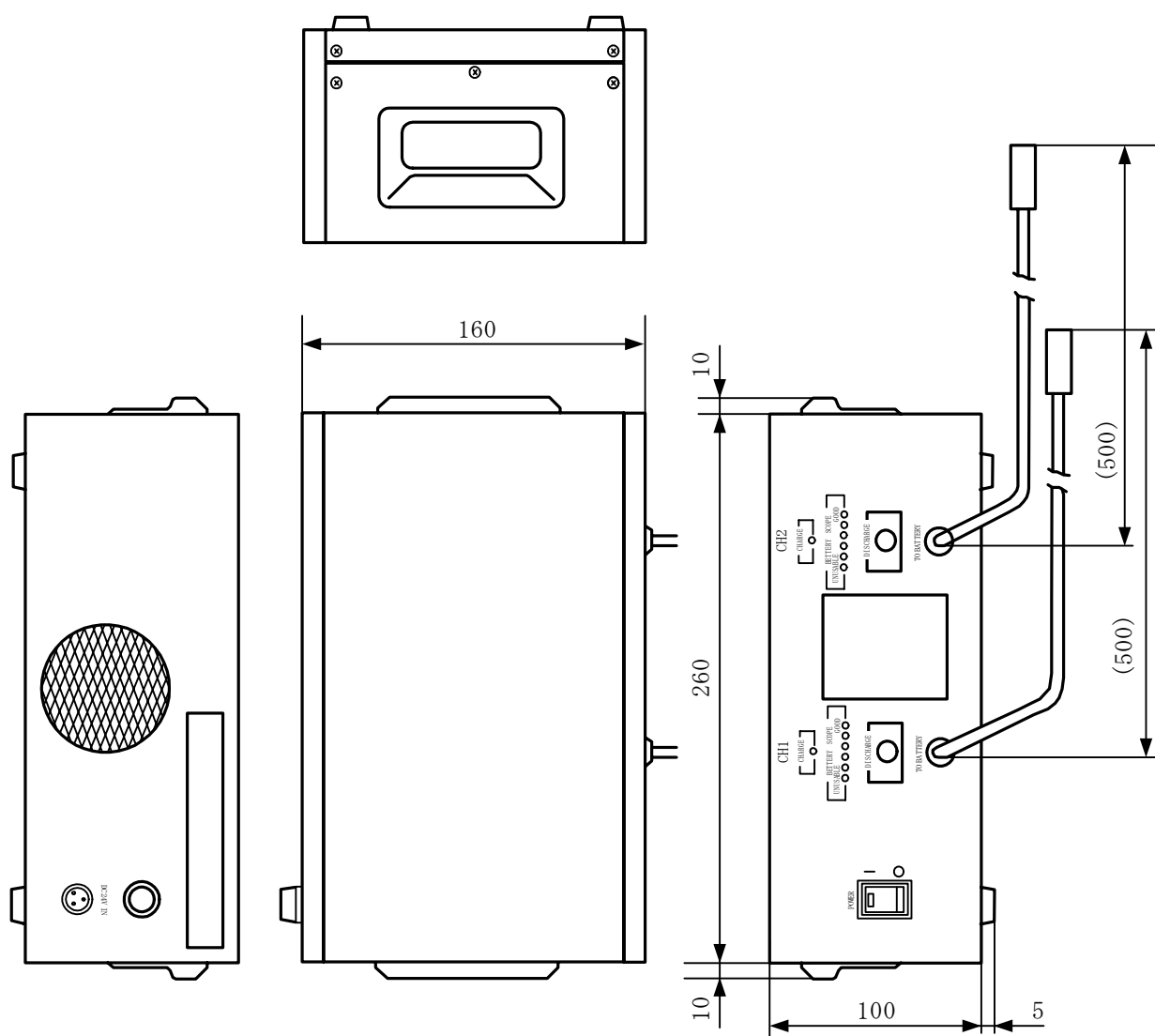
8.2.8 C-mount Adapter



8.2.9 G-resistant Rubber



8.2.10 Battery Charger (For the Main Unit Battery)



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