

User's Manual

High Speed Digital Camera System

MEMRECAM GX-5

Model ST-769 (8ch)
 ST-789 (4ch)

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nac Image Technology, Inc.

Introduction

The MEMRECAM GX-5 is designed to analyze images moving at speeds not visible to the naked eye.

The MEMRECAM GX-5 has an unitized configuration with an IC memory as the storage medium and the camera head structure that it divided 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-5 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-5 responds to the need for faster speeds and higher resolution. If using the P2-Cam or the S2-Cam and the recording speed is 1,000 frames per second, recording is possible at 640(H)x480(V). Additionally, if using a split frame, high speed recording is possible up to 100,000 frames per second (32(H)x 16(V)) . If using the HR-Cam and recording at 1,000 frames per second, recording is possible at 1280(H)x960(V). Additionally, if using a split frame, high speed recording is possible up to 100,000 frames per second (64(H)x32(V)) .

If using the C-Cam and recording at 1,000 frames per second, recording is possible at 640(H)x480(V). Additionally, if using a split frame, high speed recording is possible up to 25,000 frames per second (32(H)x 16(V)) .

If using the μ -Cam and recording at 250 frames per second, recording is possible at 640(H)x480(V). Additionally, if using a split frame, high speed recording is possible up to 1,000 frames per second (640(H)x 210(V)) .

Also, high speed image transmission to the control computer can be performed according to the high speed network (10BASE-T, 100BASE-TX, 1000BASE-T).

The MEMRECAM GX-5 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-5 with these features.

Trademark

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Descriptions of the GX-5 firmware Ver.1.71 and J-PAD3 firmware Ver.2.90 are provided in this manual.

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Read Before Using

Safety Precautions

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

DANGER

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

WARNING

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

CAUTION

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

Handling Precautions



Safety alert symbol

This is a 「Safety Alert Symbol」.

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



Grounding terminal symbol

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

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



High voltage warning symbol

This symbol is displayed in areas of dangerously high voltage.

Remove the power cable from the outlet when replacing fuses.

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



High temperature caution symbol

This symbol is displayed in areas with dangerously high temperatures if touched.

The device heats up when powered and may reach high temperatures.

Do not touch during operation. There is a danger of starting a fire.

Precautions for Use



Caution Verify Power Input

If using an AC adapter (option) to input power to the system, use AC100~240V/47~63Hz (for 4ch DRP) or AC100~240V/47~63Hz (8ch DRP), or DC20~32V for DC or battery usage. Check the voltage, frequency and polarity before connecting to a power source.



Caution Operating Environment

GX-5 DRP UNIT

- 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.

AC adapter (4ch DRP)

- Use in locations where the ambient temperature is 0~+60°C and the RH is 5~95%. Use where there is no condensation.
- Store where the ambient temperature is -40~+85°C and the RH is 5~95%. 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.

AC adapter (8ch DRP)

- Use in locations where the ambient temperature is 0~+70°C and the RH is 5~95%. Use where there is no condensation.
- Store where the ambient temperature is -40~+85°C and the RH is 5~95%. 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-5 is a model that is designed and manufactured to have greater vibration and impact resistance, and is suitable for on-board installation. However, please be aware of the following conditions.

- The DRP and camera head have the vibration resistance and impact resistance properties. There are no vibration resistance and impact resistance properties on the AC adapter (option) , J-PAD3 (option) and such. Contact a retail outlet for power sources or lenses with vibration resistance and impact resistance properties.
- For cable connections to the DRP connector part, all of the connectors have vibration resistance and impact resistance properties.
- When mounting the DRP, mount only using the ten M10 screw openings on the bottom of the GX-5 8ch DRP. Additionally, mount the GX-5 4ch DRP with the six M10 screw openings on the bottom or rear panel.



Caution Handling the DRP Unit

The inside of the DRP unit contains parts that are precisely manufactured and installed. Please keep the screws in the DRP cover tightened and do not open the cover under any circumstances (even if the DRP 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.



Caution 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-5 is equipped with a standard memory backup battery so do 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 stationery pattern noise for each sensor. In this product, noise reduction is performed by correcting the temperature changes as well as the stationery pattern noise for the sensor.

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

(Cf. 3-52 3.3.8 Black balance)

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-5 is for one year after delivery.

For details, refer to the attached warranty.

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Overview

1.1 MEMRECAM GX-5 Standard Components

The MEMRECAM-GX-5 8ch and 4ch high speed digital camera system are comprised of the following components. (table 1-1, 2)

Table1-1 MEMRECAM GX-5 8ch Standard Components

Name of Part	Model	Quantity
MEMRECAM GX-5 8ch DRP (Digital Recording Processor)	V-338	1
Simple J1 Cable (GX-5 8ch DRP Only) (TRIG 1 only)	586396	1
Simple J2 Cable (Viewfinder, J-Pad 3, USB only)	584258	1
Simple J3 Cable (Ethernet only)	584260	1
Video BNC Conversion Cable (0.2m)	584254-2	1

Table1-2 MEMRECAM GX-5 4ch Standard Components

Name of Part	Model	Quantity
MEMRECAM GX-5 4ch DRP (Digital Recording Processor)	V-339	1
Simple J1 Cable (Power , TRIG 1 only)	586392	1
Simple J2 Cable (Viewfinder, J-Pad 3, USB only)	584258	1
Simple J3 Cable (Ethernet only)	584260	1
Video BNC Conversion Cable (0.2m)	584254-2	1

1.2 Exterior View and Names of Each part

The exterior of the MEMRECAM GX-5 DRP is shown below (Figure 1-1~2).



Figure 1-1 MEMRECAM GX-5 8ch DRP exterior



Figure 1-2 MEMRECAM GX-5 4ch DRP exterior

1.2.1 Front Panel

The front panel of the MEMRECAM GX-5 8ch DRP, 4ch DRP are shown below (Figure 1-3~4).

The current status for each port and the camera head connected to it is displayed on the front panel by eight PORT LED. In addition the status for the DRP is displayed by the STATUS LED.

P2-Cam, S2-Cam, C-Cam and μ -Cam are connectable to GX-5 with a maximum of eight cameras.

HR-Cam is connectable to GX-5 with a maximum of two cameras.

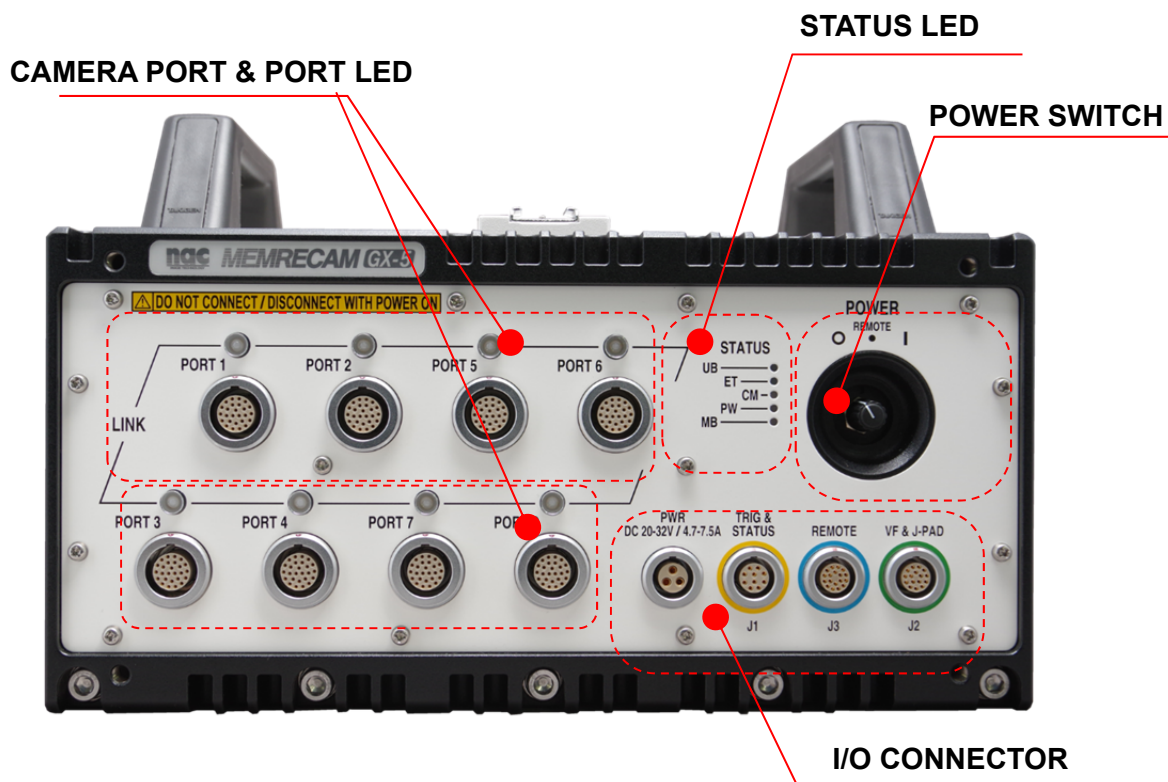


Figure1-3 MEMRECAM GX-5 8ch DRP (Front Panel)

The current status for each port and the camera head connected to it is displayed on the front panel by four PORT LED. In addition the status for the DRP is displayed by the STATUS LED. P2-Cam, S2-Cam, C-Cam and μ -Cam are connectable to GX-5 with a maximum of four cameras. HR-Cam is connectable to GX-5 with a maximum of one camera.

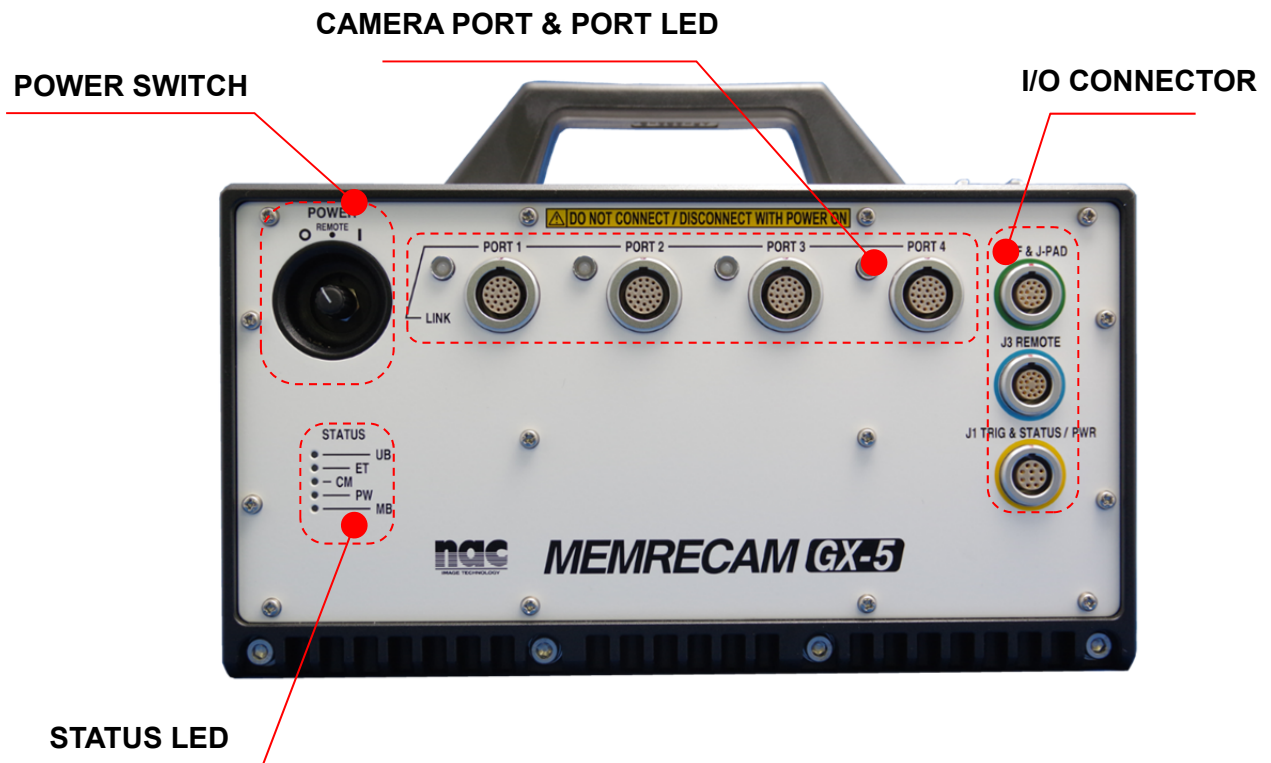


Figure1-4 MEMRECAM GX-5 4ch DRP (Front Panel)

1) Input/Output Connector

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

Table1-2a GX-5 8ch DRP Input/Output Signals and Cable Connections

Name of Connector	Name of Branch Connector	Input/Output Signal
J1 (TRIG&STATUS) ID color: Yellow	TRIG1	Falling trigger input – Contact Closure / TTL External (TRIG1)
	EST1 (※1)	Start Exposure signal input (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 J-PAD3 connection)
		DC24V output (J-PAD3 power)
	USB	USB (USB compatible storage media connection)
J3 (REMOTE) ID color: Blue	ARM-I (※2)	ARM Command input (ARM-I)
	ETHER	Ethernet (control PC connection)
	TRIG2 (※3)	External trigger input (TRIG2)
	EST2 (※3)	Start Exposure signal input / event input (EST2)
	IRIG-B (※3)	IRIG-B time code input (IRIG-B)
	EPO (※3)	Exposure panel output (EPO)
PWR	PWRCNT (※3)	Remote Power Control signal input (PWRCNT)
	(※4)	Power Input (DC 24V)

Table1-2b GX-5 4ch DRP Input/Output Signals and Cable Connections

Name of Connector	Name of Branch Connector	Input/Output Signal
J1 (TRIG&STATUS) ID color: Yellow	TRIG1	Falling trigger input – Contact Closure / TTL External (TRIG1)
	EST1 (※1)	Start Exposure signal input (EST1)
	ARM-O (※1)	ARM Status output
	FAULT (※1)	FAULT Status output
	PWR	Power Input (DC 24V)
J2 (VF&J-PAD) ID color: Green	VF	Video signal output
		DC24V output (VF power)
	JPAD	RS232C (Remote Control J-PAD3 connection)
		DC24V output (J-PAD3 power)
	USB	USB (USB compatible storage media connection)
J3 (REMOTE) ID color: Blue	ARM-I (※2)	ARM Command input (ARM-I)
	ETHER	Ethernet (control PC connection)
	TRIG2 (※3)	External trigger input (TRIG2)
	EST2 (※3)	Start Exposure signal input / event input (EST2)
	IRIG-B (※3)	IRIG-B time code input (IRIG-B)
	EPO (※3)	Exposure panel output (EPO)
PWR	PWRCNT (※3)	Remote Power Control signal input (PWRCNT)
	(※4)	Power Input (DC 24V)

(※1) Full Wired J1 cable (optional) required.

(※2) Full Wired J2 cable (optional) required.

(※3) Full Wired J3 cable (optional) required.

(※4) The power supply input connector only in GX-5 8ch DRP. GX-5 4ch DRP becomes the input from J1 cable.

1. EST1 Input

When the MEMRECAM GX-5 is set to **EST1** mode, the Exposure Start Signal is synchronized to the input signal received on the **Full Wired J1** cable, branch **P11 (EST1)** from an external pulse generator. Please refer to / 7 / *Specifications / APPENDIX B - Exposure Start Signal (EST) and Event Signal* / for additional details.

2. EST2 Input

When the MEMRECAM GX-5 is set to **EST2** mode, the Exposure Start Signal is synchronized to the input signal received on the **Full Wired J3** cable, branch **P32 (EST2)** from an external pulse generator. Please refer to / 7 / *Specifications / APPENDIX B - Exposure Start Signal (EST) and Event Signal* / for additional details.

3. ARM Command Input

The MEMRECAM GX-5 will enter **ARM** mode when a signal is supplied to the **Full Wired J2** cable, branch **P20 (ARM-I)**. Please refer to / 7 / *Specifications / APPENDIX D - Discrete Interface*/ for additional details.

4. IRIG-B Input

When the MEMRECAM GX-5 is set to **IRIG-B Synchronous** mode, the camera is synchronized to the input signal received on the **Full Wired J3** cable, branch **P33 (IRIG-B)** from an IRIG time clock generator. Please refer to / 7 / *Specifications / APPENDIX E IRIG-B* /for additional details.

5. Power Control Signal Input

When the power switch on the MEMRECAM GX-5 front panel is set to **REMOTE** the camera can be turned ON and OFF remotely via the **Full Wired J3** branch cable, branch **P36 (PWRCNT)**. With the circuit open (HI) the power is ON. When there is a short or LOW signal the power is turned OFF. Please refer to / 7 / *Specifications / APPENDIX D - Discrete Interface*/for additional details.

2) Status LED

There are five status LEDs on the front panel showing the status of the MEMRECAM GX-5 DRP. 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-5 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(during EST synchronized signal recording)	
	Lit magenta	ARM mode
	Flashing magenta(during EST synchronized signal recording)	
	Lit orange	REC mode
	Flashing orange(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)	Flashing green (backing up with battery)	Valid memory backup, Charge: High
	Lit green(backing up with external power)	
	Flashing orange(backing up with battery)	Valid memory backup, Charge: Medium
	Lit orange(backing up with external power)	
	Flashing red(backing up with battery)	Valid memory backup, Charge: Low
	Lit red(backing up with external power)	
	Not lit	No memory backup data

(※1) Fail status: During MEMRECAM GX-5 DRP operation it indicates that a malfunction detected (i.e. abnormal power voltage, increase in the sensor temperature, abnormal trigger signal, etc.)

(※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) Power Switch

Operation of the power switch is shown below. It is assumed that the power supply is energized and connected to the MEMRECAM GX-5.

1. When the power switch on the front panel is set to 「O」 the MEMRECAM GX-5 is turned **OFF**.



2. When the power switch on the front panel is set to 「|」 the MEMRECAM GX-5 is turned **ON**.



3. The 「**REMOTE**」 setting on the power switch is used when operating with the GX-HUB/GX-HUBi (optional) or when controlling remotely via the **Full Wired J3** branch cable, branch **P36 (PWRCNT)**.

With the GX-HUB/GX-HUBi connected the power switch on the GX-HUB/GX-HUBi controls the power setting of the MEMRECAM GX-5 DRP.

With an open circuit (HI) on the J3 (**PWRCNT**) connector the power is ON. When there is a short or LOW signal the power is turned OFF. When not connected to a GX-HUB/GX-HUBi and the MEMRECAM GX-5 power switch is set to 「**REMOTE**」 the DRP turns ON.



4) Camera Port , Port LED



Always turn the power OFF when connecting and disconnecting camera heads. It is possible to damage the electronics and/or electric shock.

The camera heads connect to PORT1-PORT8 respectively and an LED shows the connection status for each port. Each LED lights up and changes color according to changes in status (Table 1-4).

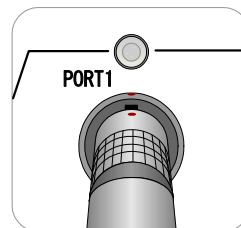
Table 1-4 Description of the port LED

	Display Color and Flashing Status	Readiness to take a picture	Connected status of camera head	Status of port
①	Not lit	–	Before Startup	–
②	Flashing green(quick)	–	During Startup	–
③	Flashing yellow(slow)	△	Startup Successful	Disabled
④	Flashing yellow(quick)	×	Not Connected	Enabled
⑤	Lit yellow	×	Not Connected	Disabled
⑥	Lit green	○	Startup Successful	Enabled
⑦	Flashing red(quick)	×	Startup Failure	Enabled
⑧	Lit red	×	Startup Failure	Disabled

NOTE: If the correct camera configuration is set, it is possible to operate a camera connected to a port with the LED Flashing yellow (slowly) “△”. **Do not** connect the camera with the power turned on.

LED - OFF

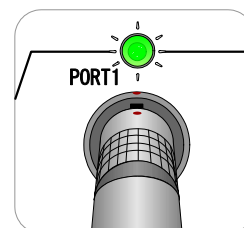
When the MEMRECAM GX-5 is first turned on, all the port LED remain off while the DRP starts up.



LED : Turn off

LED – Flashing YELLOW (Quick)

After the DRP completes its initial boot sequence, all the port LED flashes green (quick) when the DRP attempts to start up the camera heads.

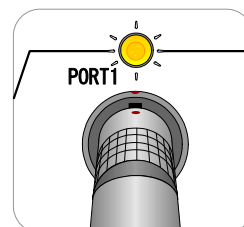


LED : Flashing green(quickly)

LED – Flashing YELLOW (Slow)

The port LED flashes yellow (slowly) when a camera head is connected to a disabled (invalid) port. *It is necessary to perform one of the following.*

- Change the camera configuration to enable the port. Please refer to / 2 / **Basic Operation** / 2.4 / **Camera Configuration Setup** / for additional details.
- Turn off the power and move the camera head to an enabled (valid) port.
- Turn off the power and disconnect the camera head from the disabled (invalid) port.



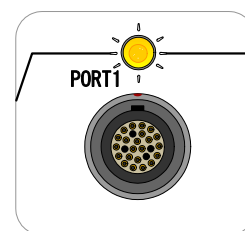
LED : Flashing yellow(slowly)

LED – Flashing YELLOW (Quick)

The port LED flashes yellow (quick) when a camera head is not connected to the enabled (valid) port. *It is necessary to perform one of the following.*

④

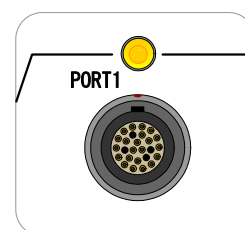
- Change the camera configuration to disable the port. Please refer to / 2 / **Basic Operation** / 2.4 / **Camera Configuration Setup** / for additional details.
- Turn off the power and connect a camera head to the enabled (valid) port.



LED : Flashing yellow(quickly)

LED – Lit YELLOW (Solid)

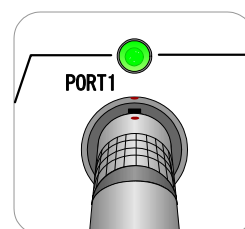
When the port is disabled (invalid) and there is no camera head connected to it, the LED remains solid yellow.



LED : Light yellow

LED – Lit GREEN (Solid)

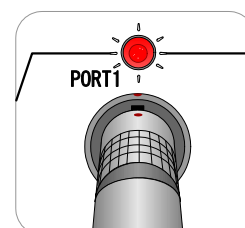
When the port is enabled (valid) and there is a camera head connected to it, the LED remains solid green. The port has successfully connected to the camera head and is ready to record.



LED : light green

LED – Flashing RED (Quick)

When the port is enabled (valid) but there is a problem communicating with the camera head connected to it, the LED flashes red (quick).

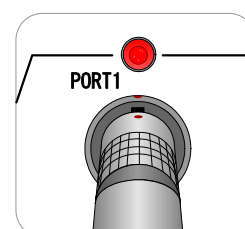


LED : Flashing red(quickly)

LED – Solid

When the port is disabled (invalid) and there is a problem communicating with the camera head connected to it, the LED remains solid red.

Moreover, when the camera configuration setting is done in the state of ☐, LED of the port lights red.



LED : Light red

1.2.2 Side Panel

The MEMRECAM GX-5 side panel (left) is shown below (Figure 1-3).

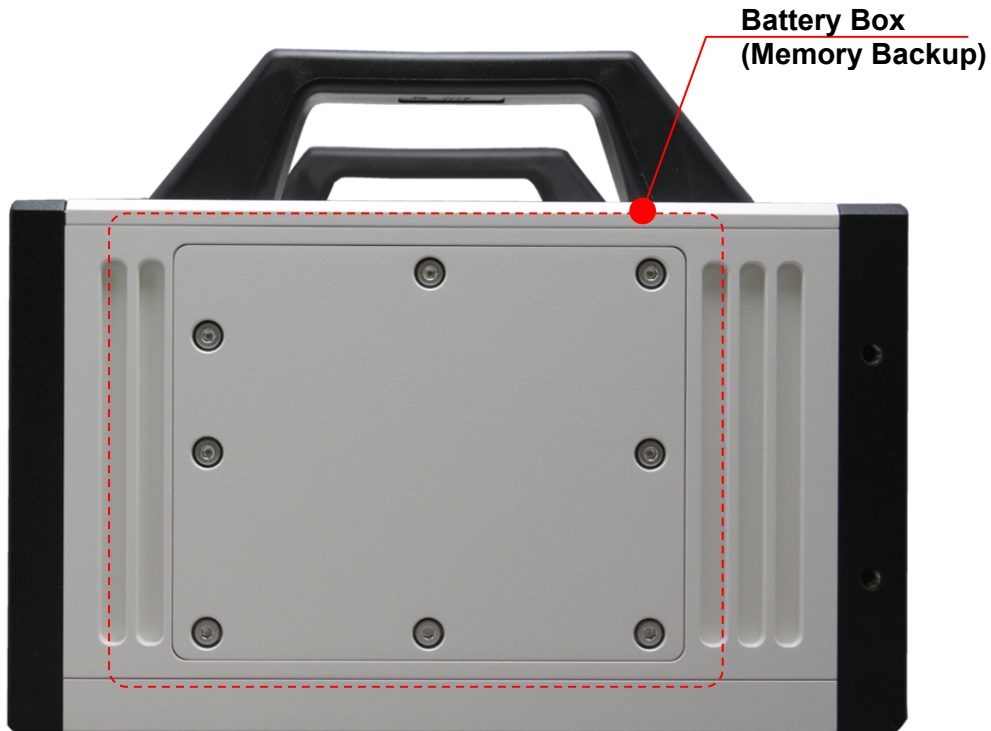


Figure 1-3 MEMRECAM GX-5 8ch DRP (Left Side Pane)

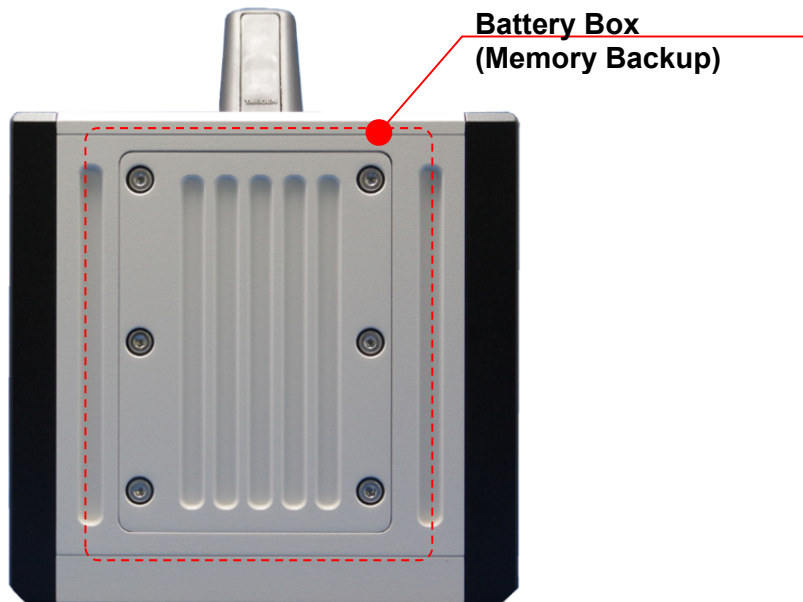


Figure 1-3 MEMRECAM GX-5 4ch DRP (Left Side Panel)

Battery Box (Memory Backup)

The memory backup battery is stored in the battery box on the left side panel. Please refer to / 7 / **Specifications** / 7.4.6 – **Memory Backup** / for additional details.

1.2.3 Camera Head Configurations

1.2.3.1 Kind of camera head

The camera head has five types of P2-Cam, S2-Cam, HR-Cam, C-Cam, μ -Cam, and there is a variation each.

- P2-Cam has four kinds in a standard cable type and casing tube cable type each and is eight kinds in total

The straight head straight cable (SS)	(Figure 1-7~Figure 1-8)
The straight head angled cable (SA)	(Figure 1-9~Figure 1-10)
The angled side head straight cable (AS)	(Figure 1-11~Figure 1-12)
The angled side head angled cable (AA).	(Figure 1-13~Figure 1-14)

- S2-Cam has two kinds in a standard cable type and casing tube cable type each and is four kinds in total

The straight type	(Figure 1-15~Figure 1-16)
The side type	(Figure 1-17~Figure 1-18)

- HR-Cam has two type.

The straight type	(Figure 1-19)
The side type	(Figure 1-20)

- C-Cam has two kinds in a standard cable type and casing tube cable type each and is four kinds in total

The straight type	(Figure 1-21~Figure 1-22)
The side type	(Figure 1-23~Figure 1-24)

- μ -Cam has two kinds of camera head types and puts RELAYBOX together.

- Camera head

The side type	(Figure 1-25~Figure 1-26)
The straight type	(Figure 1-27~Figure 1-28)

- RELAYBOX (Figure 1-29)

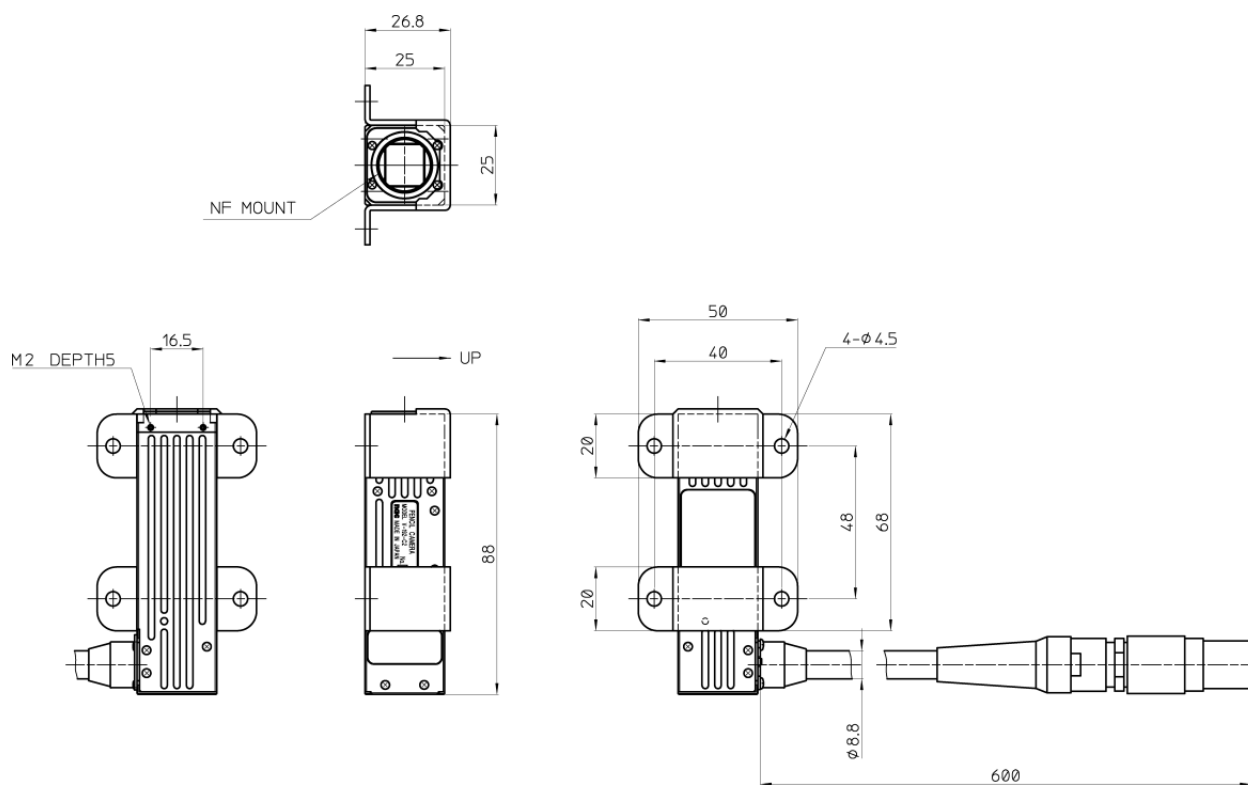


Figure 1-9 P2-Cam (SA, standard cable type)

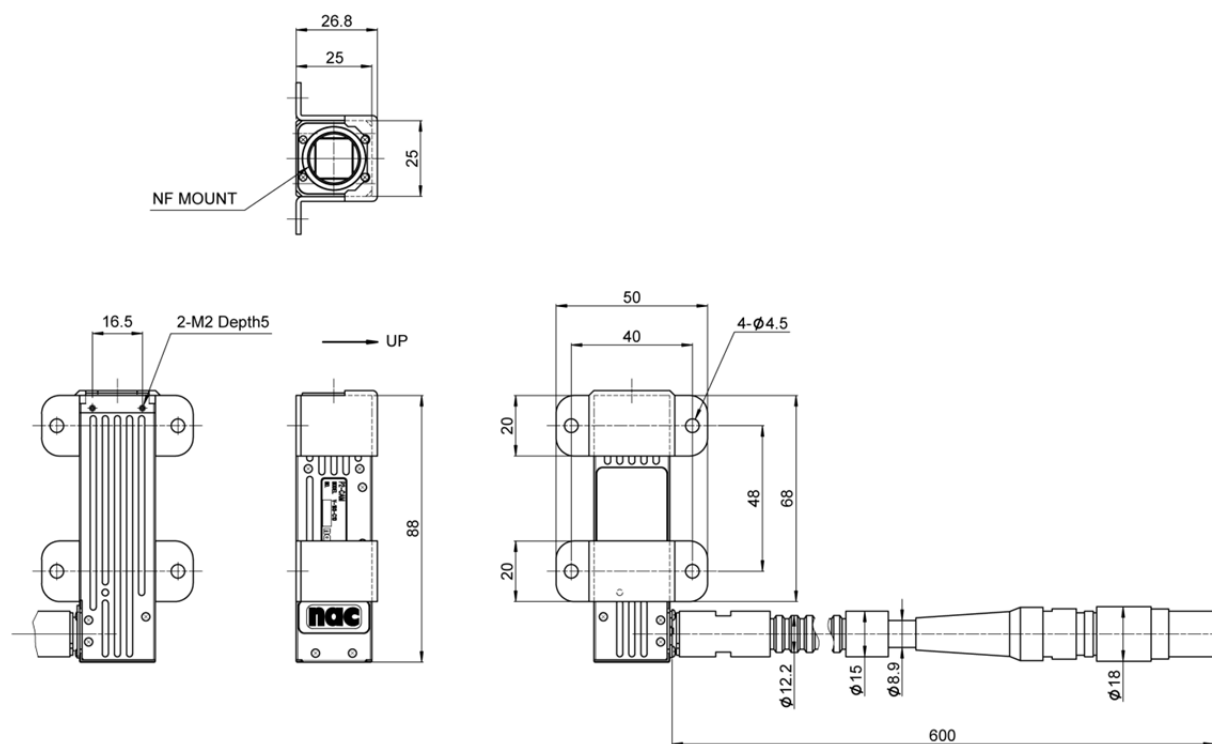


Figure 1-10 P2-Cam (SA, casing tube cable type)

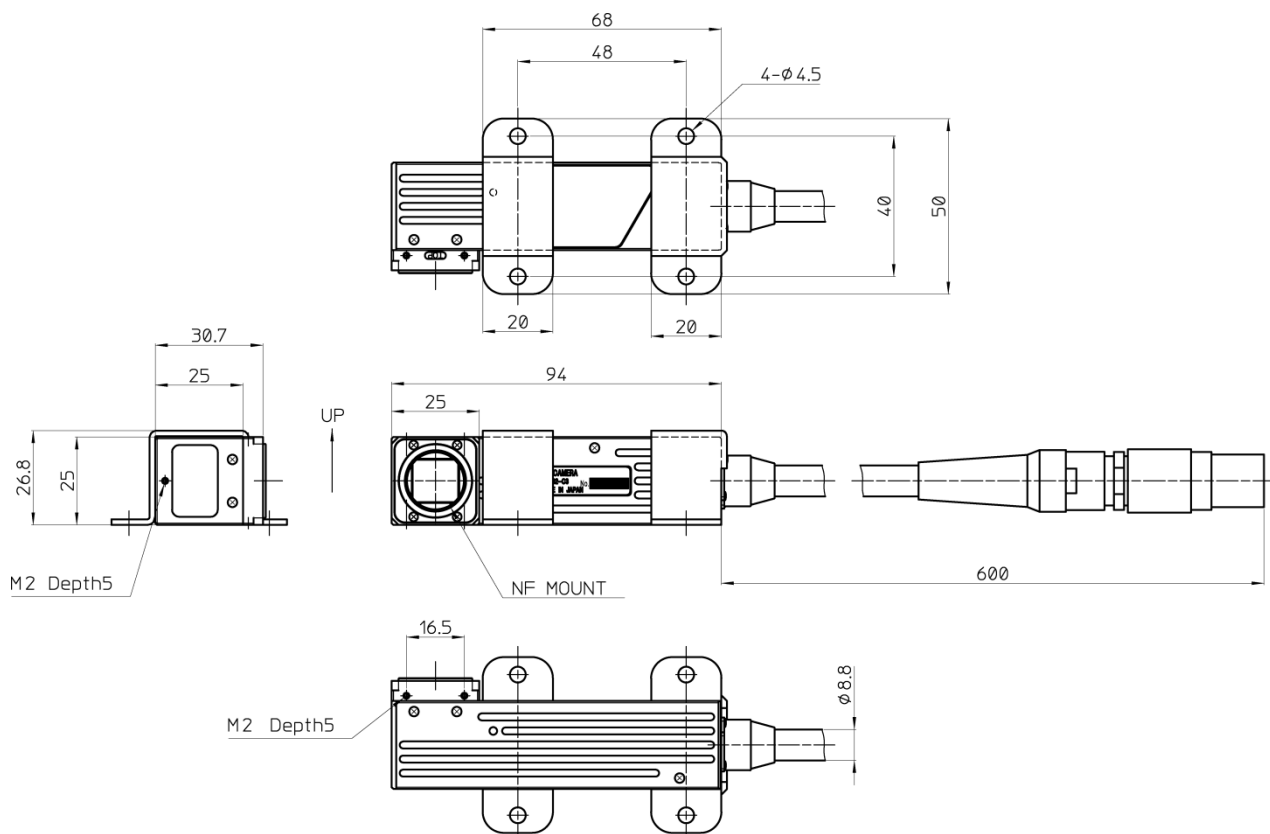


Figure 1-11 P2-Cam (AS, standard cable type)

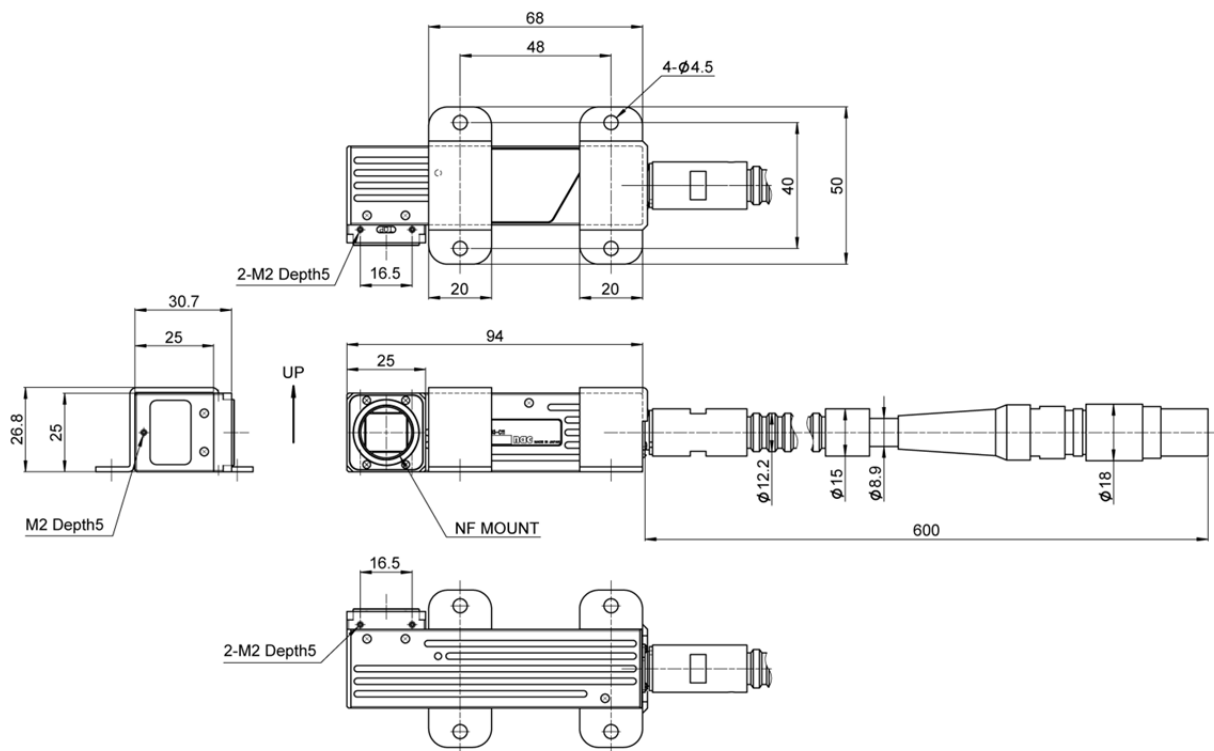


Figure 1-12 P2-Cam (AS, casing tube cable type)

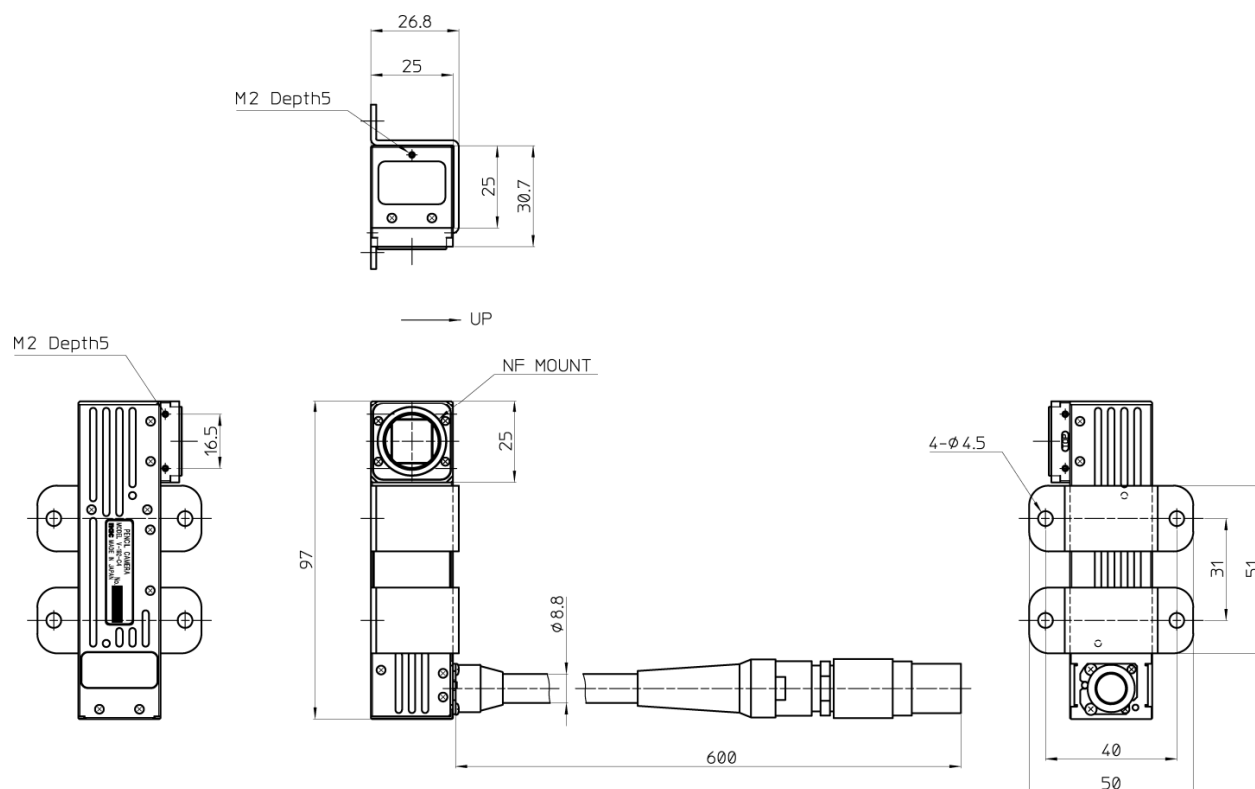


Figure 1-13 P2-Cam (AA, standard cable type)

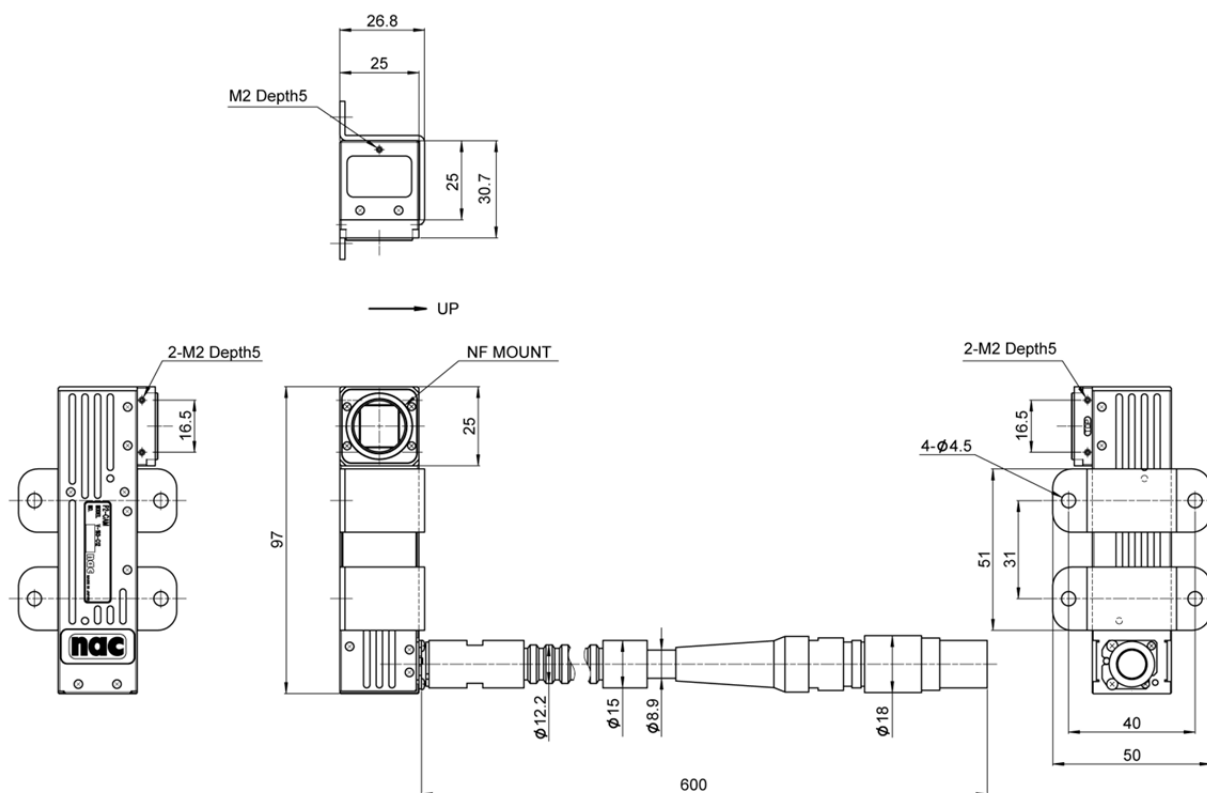


Figure 1-14 P2-Cam (AA, casing tube cable type)

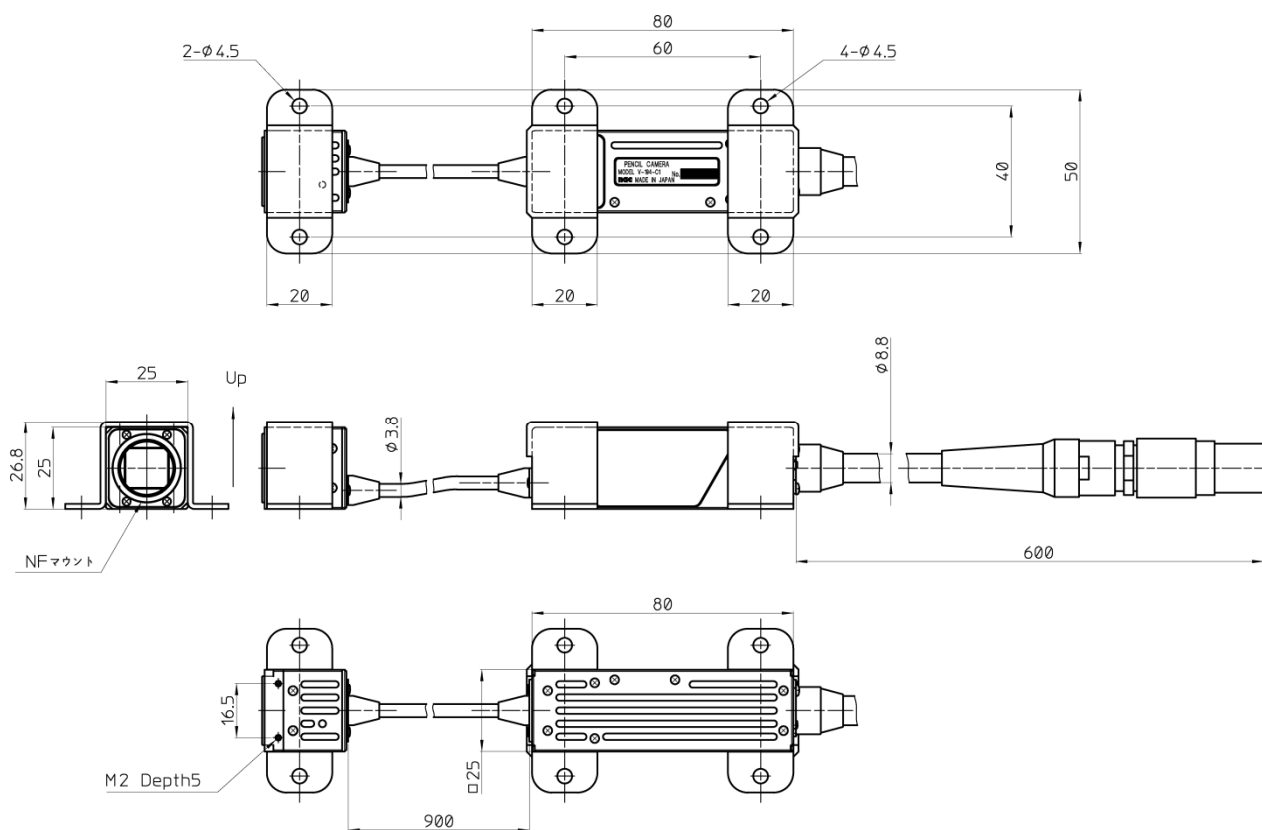


Figure 1-15 S2-Cam (Standard cable type, straight)

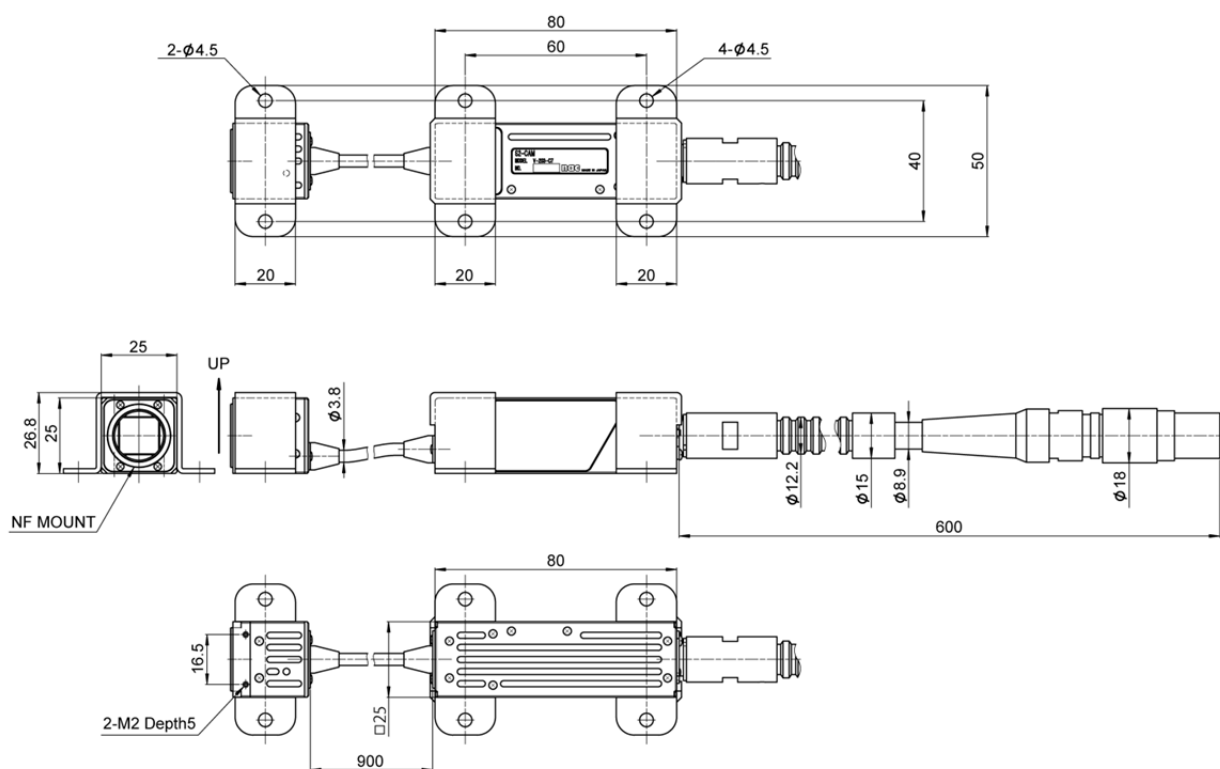


Figure 1-16 S2-Cam (Casing tube cable type, straight)

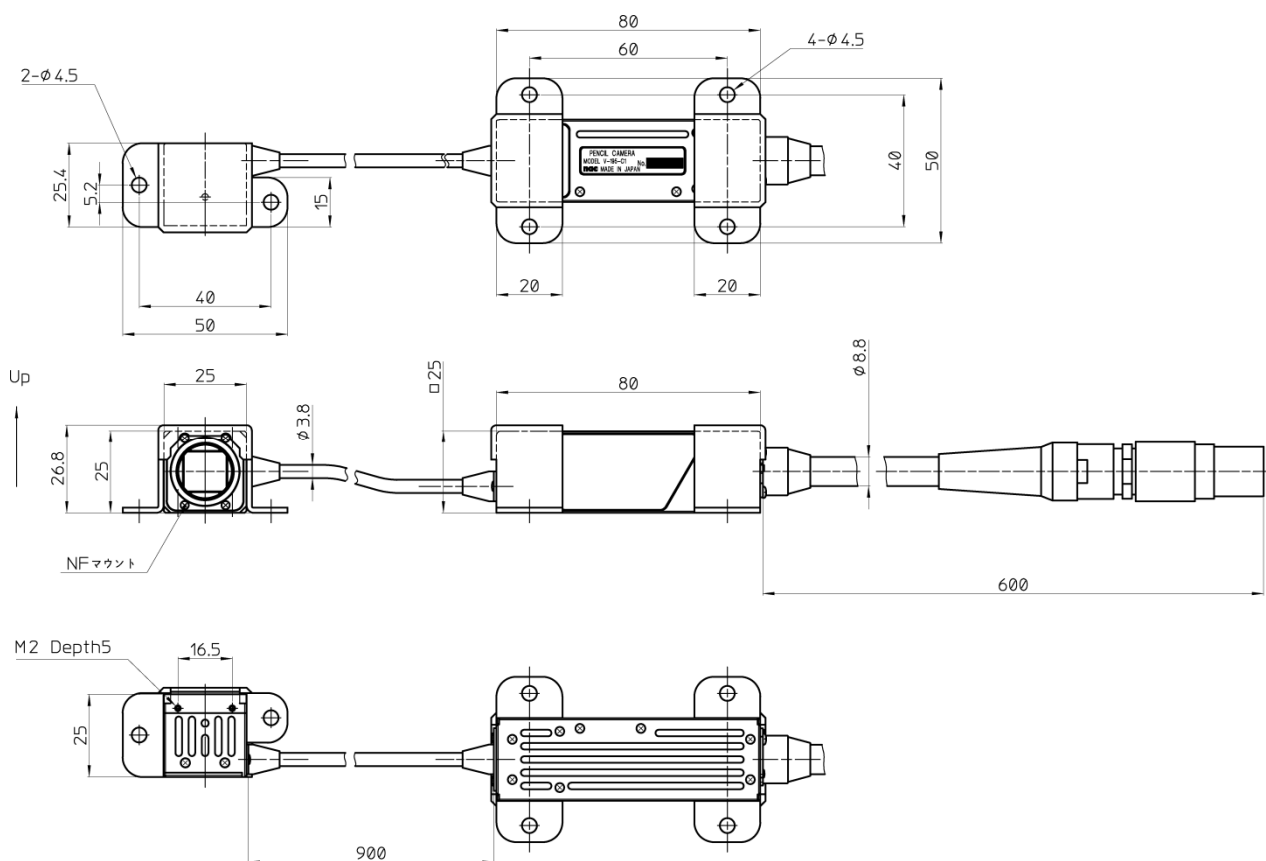


Figure 1-17 S2-Cam (Standard cable type, side)

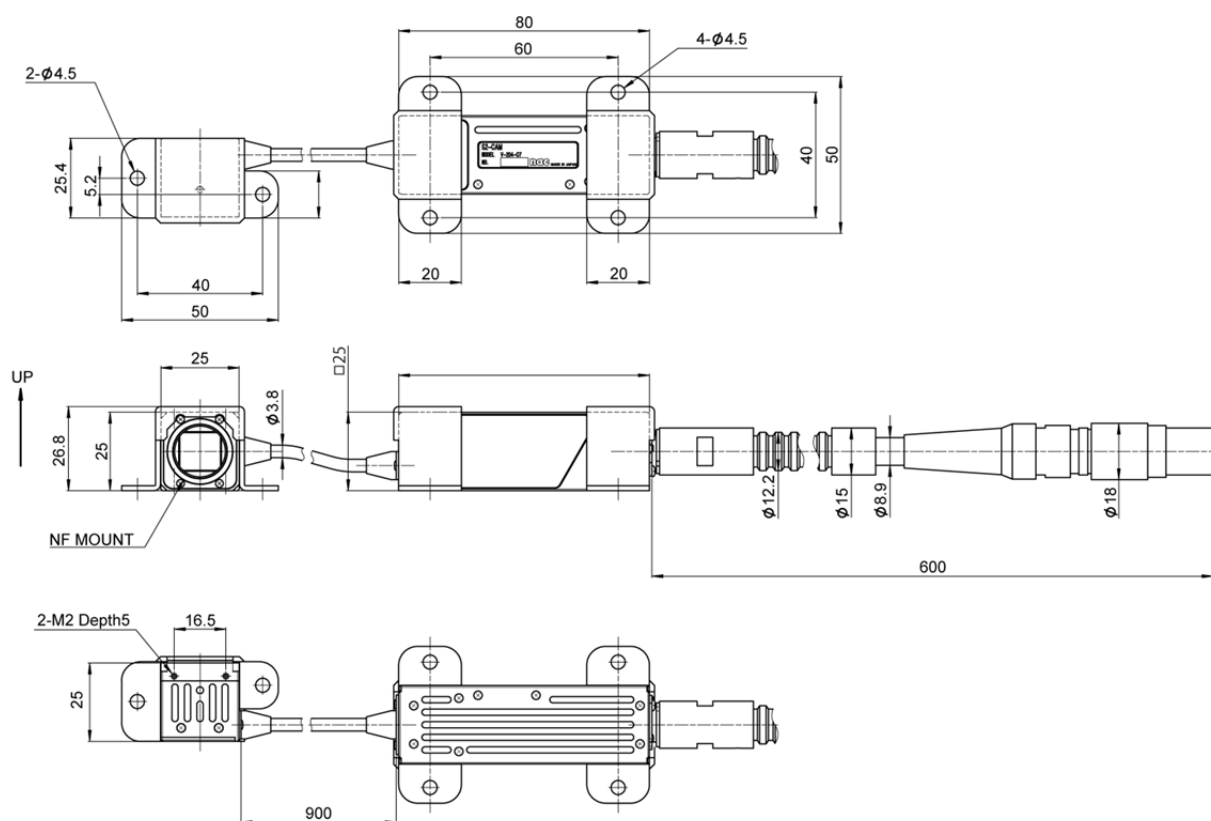


Figure 1-18 S2-Cam (Casing tube cable type, side)

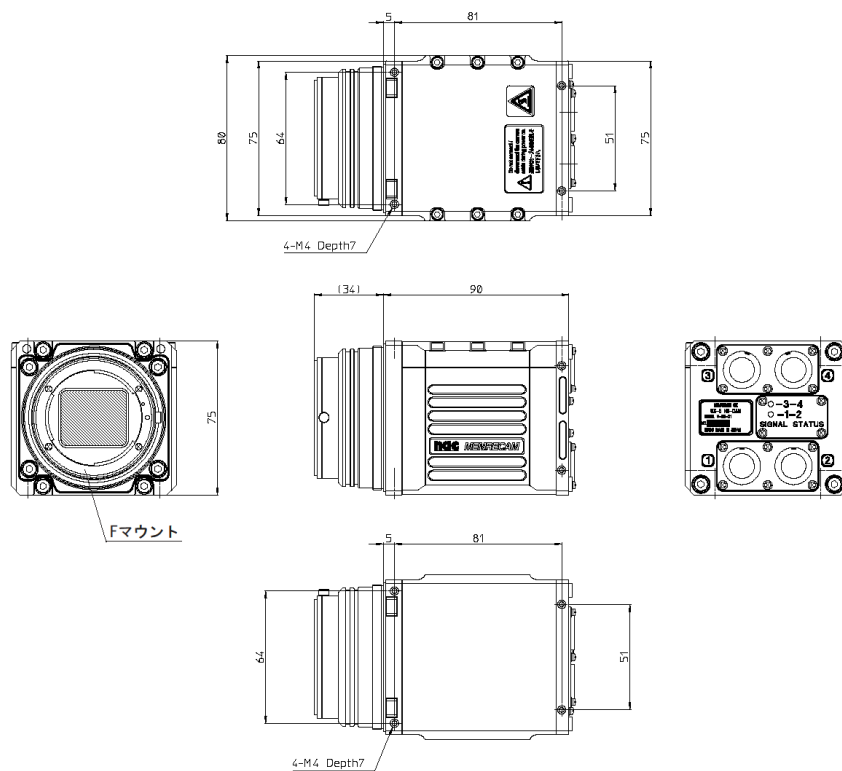


Figure 1-19 HR-Cam (Straight)

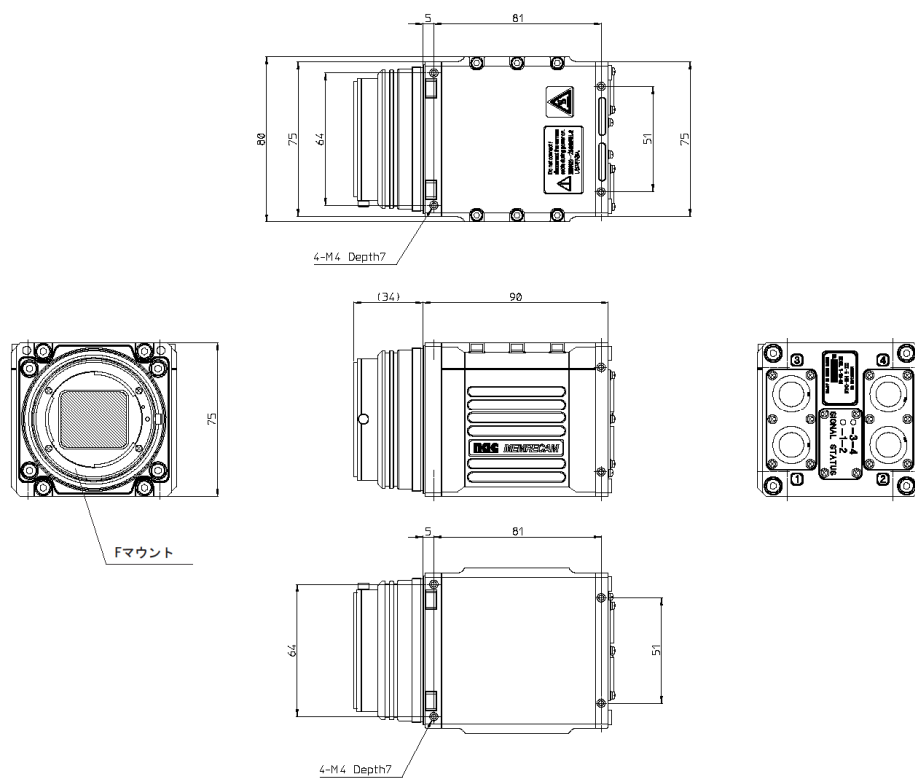


Figure 1-20 HR-Cam (Side)

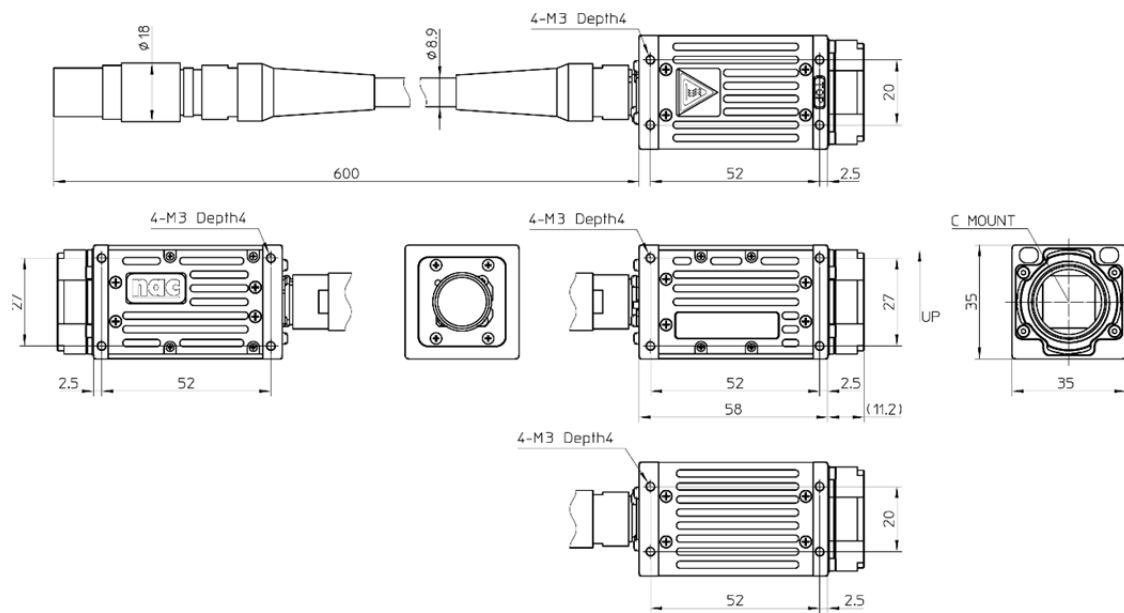


Figure 1-21 C-Cam (Standard cable type, straight)

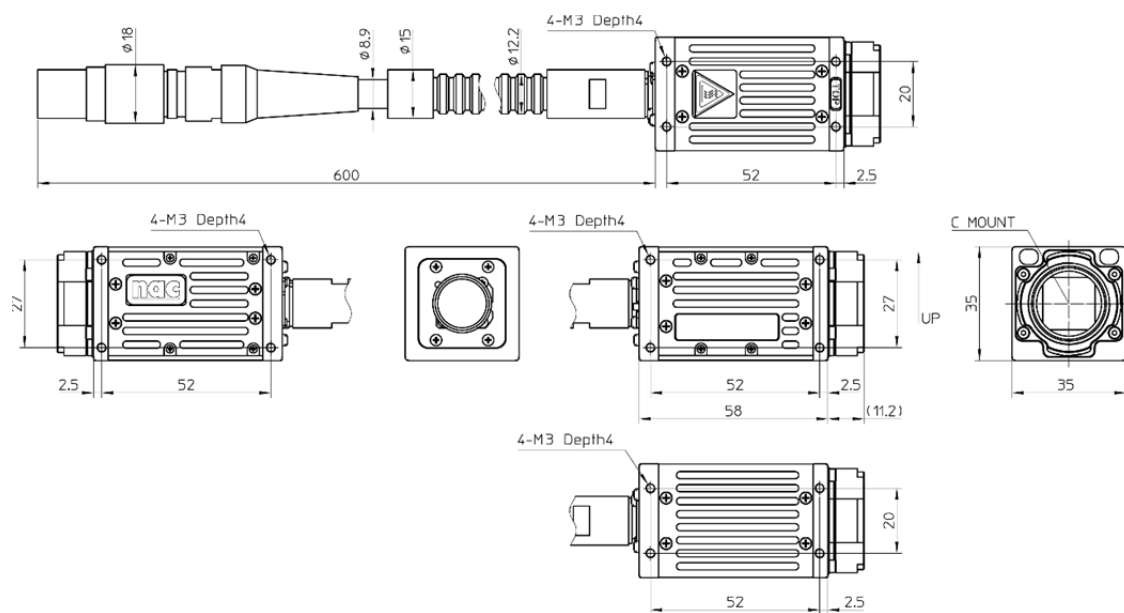


Figure 1-22 C-Cam (Casing tube cable type, straight)

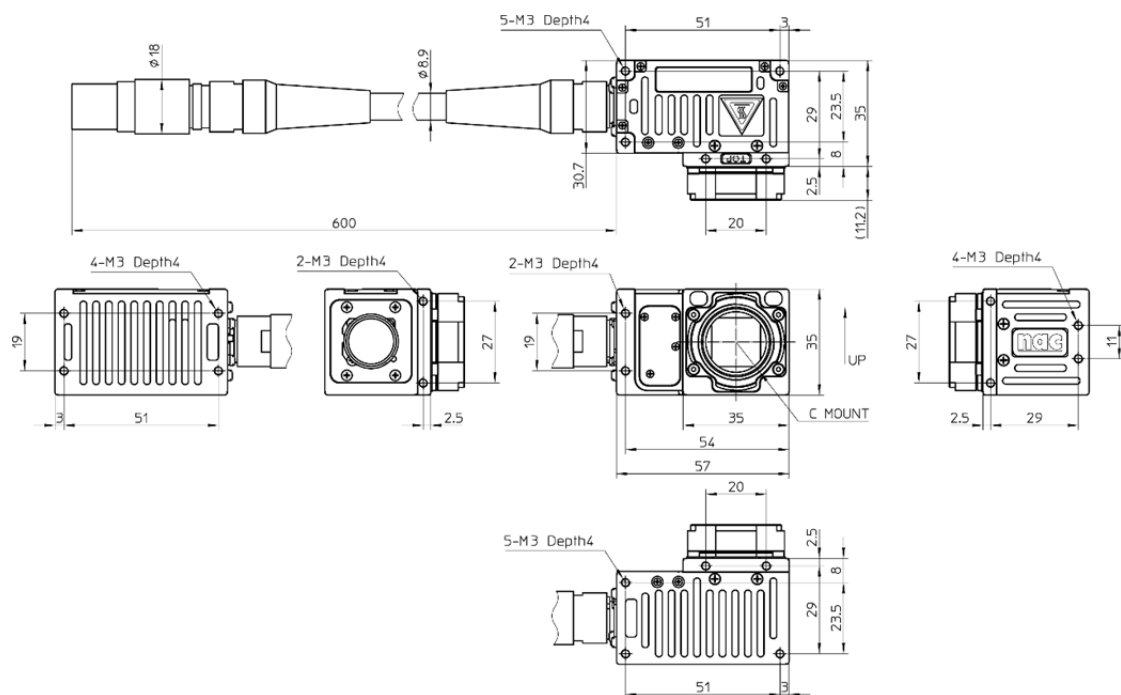


Figure 1-23 C-Cam (Standard cable type, side)

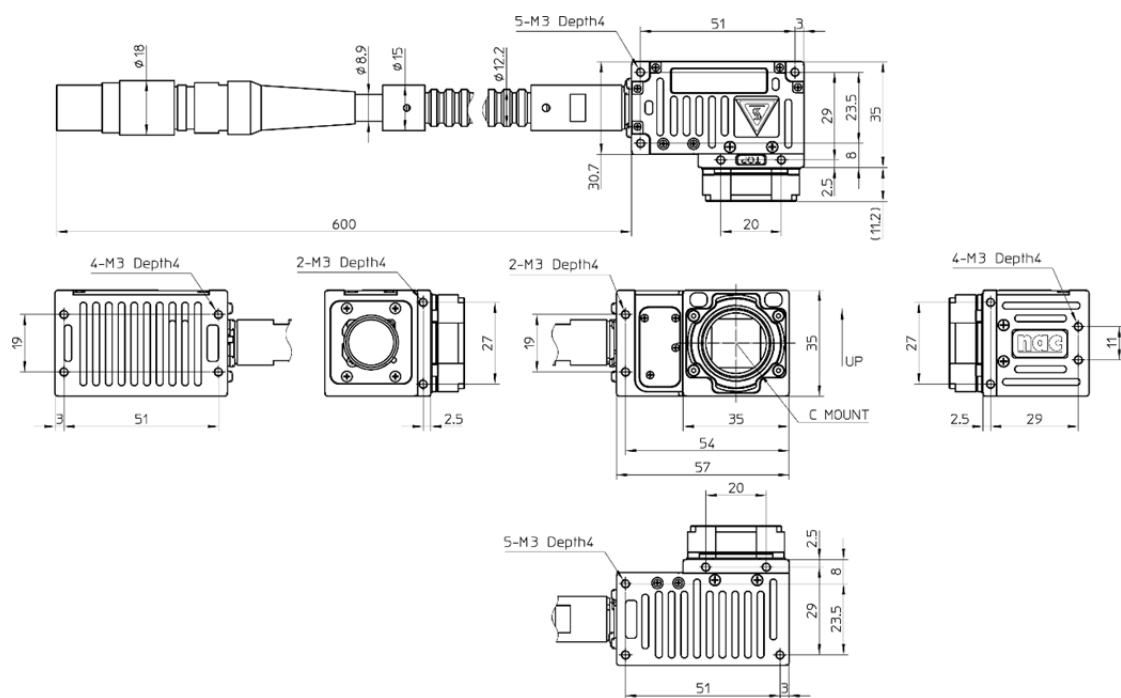


Figure 1-24 C-Cam (Casing tube cable type, side)

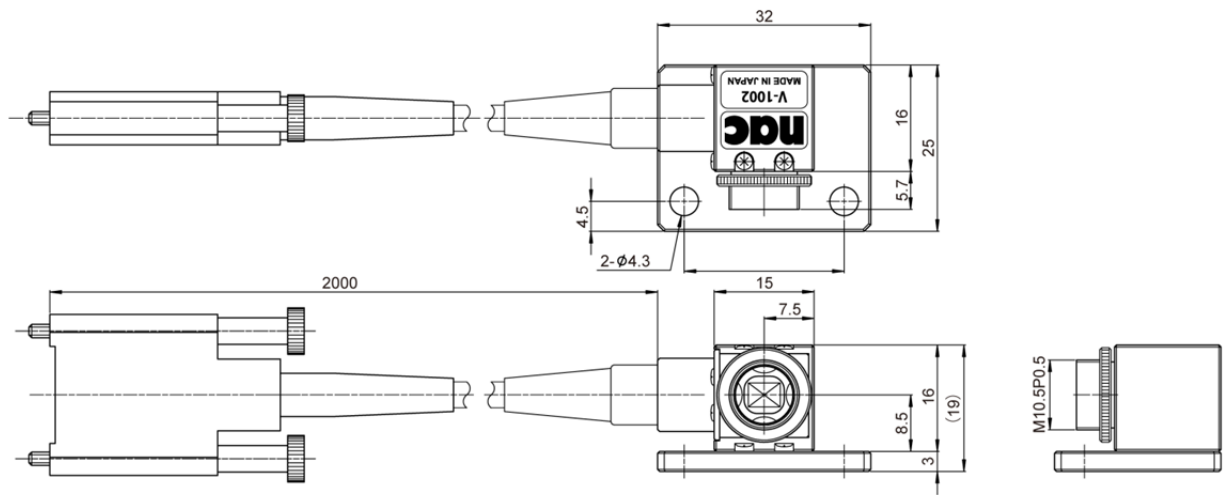


Figure 1-25 μ-Cam camera head (Side with a mounting plate)

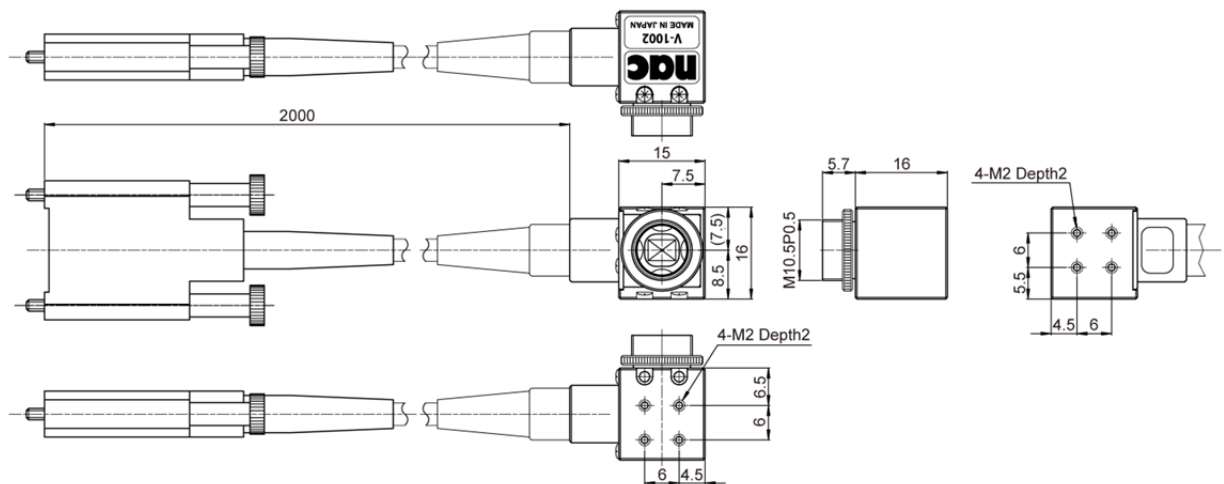


図 1-26 μ-Cam camera head (Side)

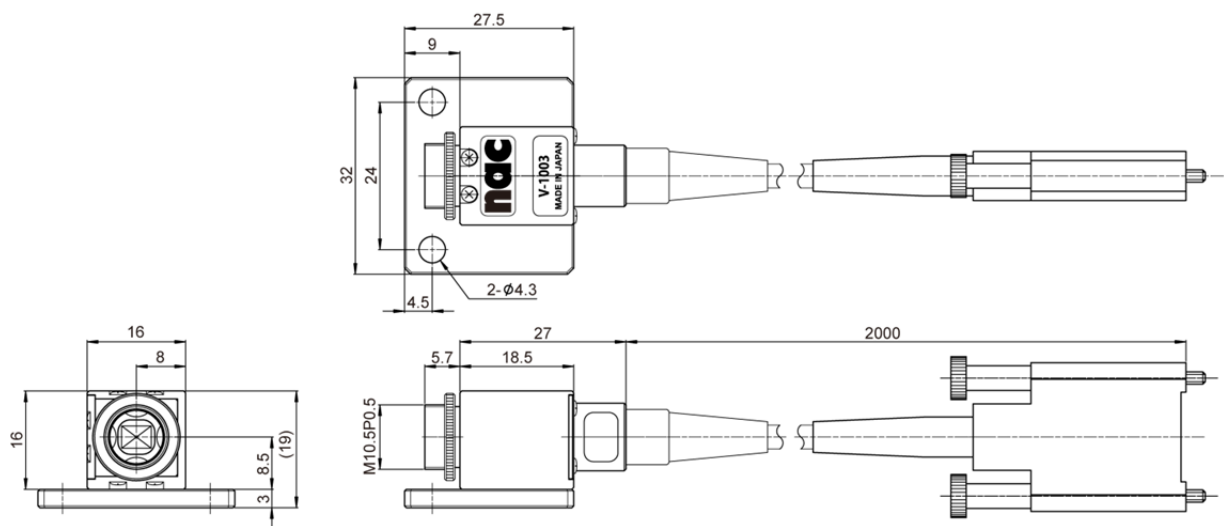


Figure 1-27 μ-Cam camera head (Straight with a mounting plate)

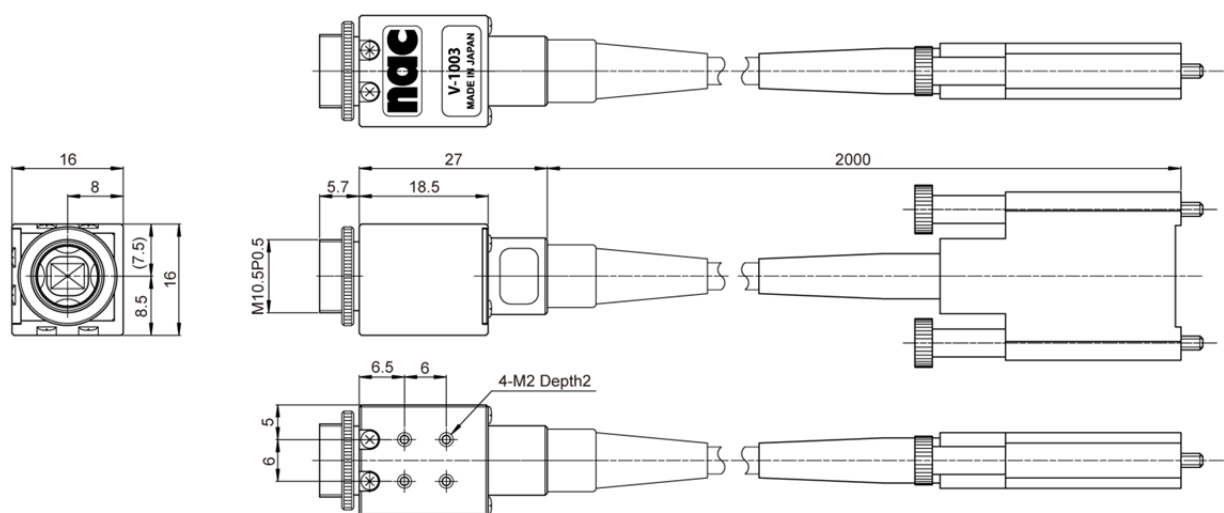


Figure 1-28 μ-Cam camera head (Straight)

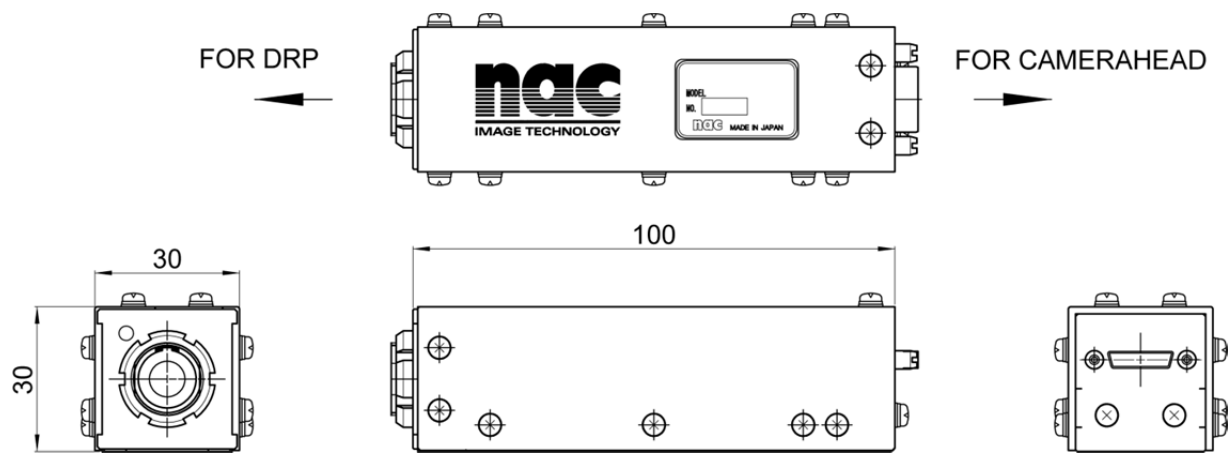


Figure 1-29 μ -Cam RELAY BOX

1.2.3.2 Types of HR-Cam Camera Cables and their External Appearances

The two types of camera cables connecting to HR-Cam include the straight type and the angled type, and either can be used for the connection.

The external appearance when the straight cable is connected to the back type camera head (Figure 1-30a), the external appearance when the straight cable is connected to the left type camera head (Figure 1-30b), the external appearance when the angled cable is connected to the back type camera head (Figure 1-30c) and the external appearance when the angled cable is connected to the left type camera head (Figure 1-30d) are shown below.



Figure 1-30a
External appearance of the back type camera + straight cable

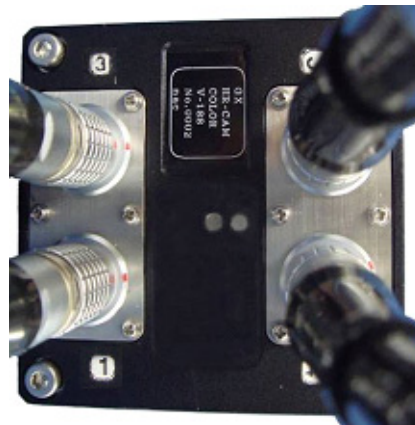


Figure 1-30b
External appearance of the left type camera + straight cable



Figure 1-30c
External appearance of the back type camera + angled cable

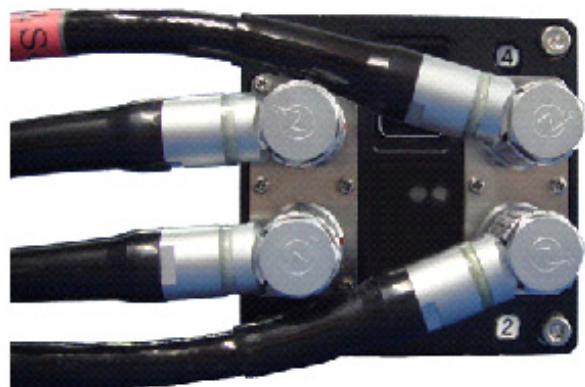


Figure 1-30d
External appearance of the left type camera + angled cable

1.2.3.3 Camera Head Sensor

The P2-Cam, S2-Cam, HR-Cam, C-Cam, and μ -Cam sensor parts are shown below (Figures 1-31a, ~ 1-31d)

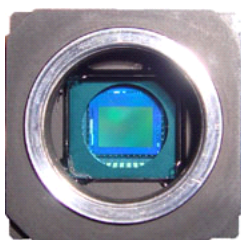


Figure 1-31a P2-Cam, S2-Cam sensor part

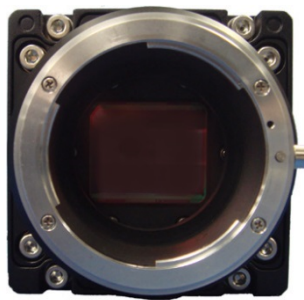


Figure 1-31b HR-Cam sensor

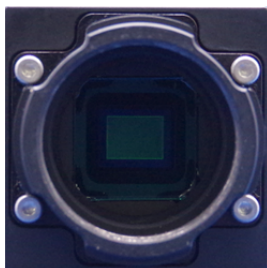


Figure 1-31c C-Cam sensor part



Figure 1-31d μ -Cam sensor part



Warning

Always replace the cap to protect the sensor when the camera head is not in use. Take care to avoid dirt or other contaminants from entering in contact with the sensor.

1.2.3.4 Camera Head Status LED Display

There is an LED that shows the camera head status for the pigtail part on the P2-Cam, S2-Cam, HR-Cam, C-Cam and μ -Cam RELAYBOX. Refer to the following.

■P2-Cam, S2-Cam,C-Cam LED Status Display

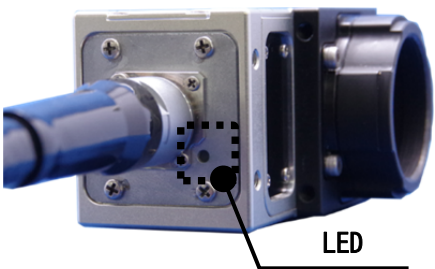


Figure 1-32 Status LED

■ μ -Cam LED Status Display

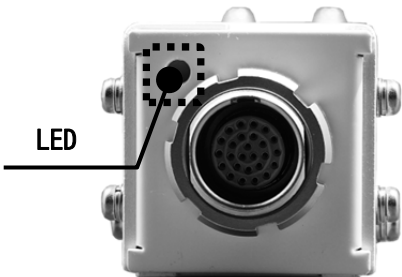


Figure 1-33 Status LED (μ -Cam RELAY BOX)

The statuses shown in the LED display are in the following table.

LED Display	Lit in green	Lit in red	Not lit
Status	Normal (Signal : LOCK)	Abnormal (Signal : UNLOCK)	No power input

■HR-Cam LED Status Display (Displays the 2 PORT status with one LED)
Shows whether or not the receiving side signal is locked.

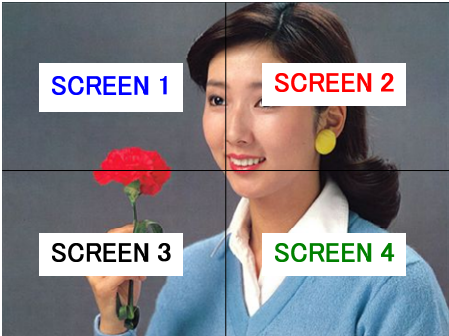


Figure 1-34a Display image



Figure 1-34b
Status Display LED (HR-Cam)

The following table shows the status of the screen, PORT and LED display.

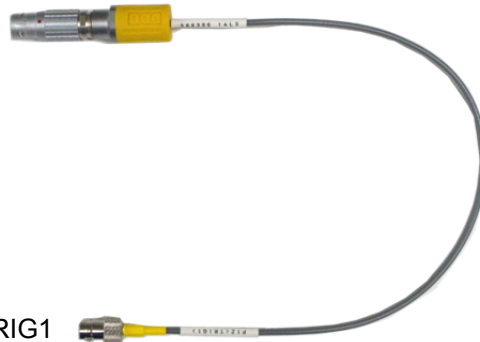
LED1						
LED Display		Lit in green	Flashing green	Flashing red	Lit in red	Not lit
Status	SCREEN 1 (PORT1)	Normal (Signal : LOCK)	Normal (Signal : LOCK)	Abnormal (Signal : UNLOCK) Or communication error	Abnormal (Signal : UNLOCK) Or communication error	No power input
	SCREEN2 (PORT2)	Normal (Signal : LOCK)	Abnormal (Signal : UNLOCK) Or communication error	Normal (Signal : LOCK)	Abnormal (Signal : UNLOCK) Or communication error	No power input

LED2						
LED Display		Lit in green	Flashing green	Flashing red	Lit in red	Not lit
Status	SCREEN 3 (PORT3)	Normal (Signal : LOCK)	Normal (Signal : LOCK)	Abnormal (Signal : UNLOCK) Or communication error	Abnormal (Signal : UNLOCK) Or communication error	No power input
	SCREEN 4 (PORT4)	Normal (Signal : LOCK)	Abnormal (Signal : UNLOCK) Or communication error	Normal (Signal : LOCK)	Abnormal (Signal : UNLOCK) Or communication error	No power input

1.3 Cables

The Simple Cable Set J1, J2, J3 (Standard) which connects to the front panel is shown below. Please refer to / 7 / **Specifications** / 7.5 – **Input Output/Connector/** for additional details.

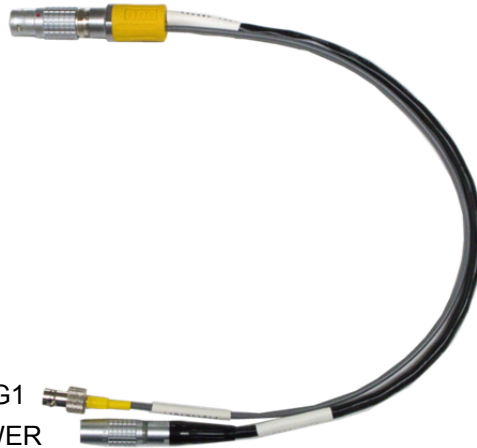
TO TRIG&STATUS(J1)



TRIG1

Figure 1-35a Simple J1 Cable (for GX-5 8ch DRP)

TO TRIG&STATUS(J1)

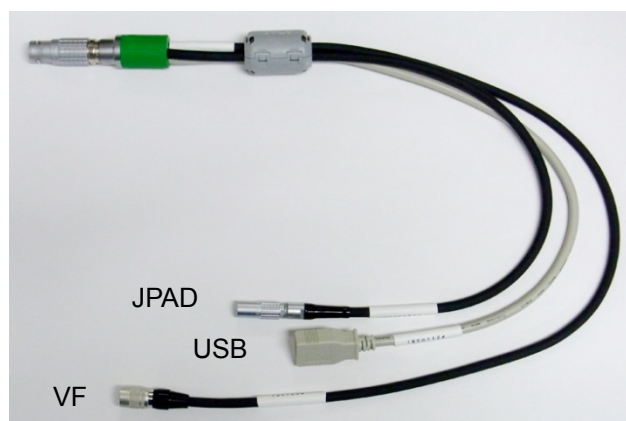


TRIG1

POWER

Figure 1-35b Simple J1 Cable (for GX-5 4ch DRP)

TO VF&J-PAD(J2)



JPAD

USB

VF

Figure 1-36 Simple J2 Cable

TO REMOTE(J3)

ETHER

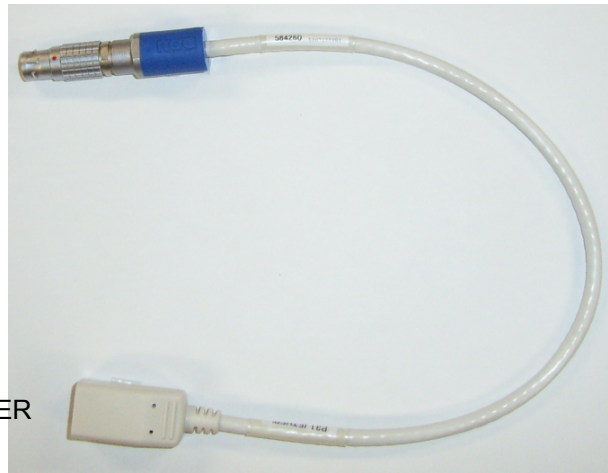


Figure 1-37 Simple J3 Cable

1.4 AC Adapter (Optional)

The exterior of the AC Adapter is shown below (Figure 1-38).

The output terminal of the AC Adapter has a special plug which connects to the **PWR DC 20-32V/4.7-7.5A** power connector on the front panel of the MEMRECAM GX-5.



Figure 1-38a AC Adapter (for GX-5 8ch DRP)



Figure 1-38b AC Adapter (for GX-5 4ch DRP)



HIGH VOLTAGE. DO NOT OPEN THE COVER.



When using a 3P-2P conversion plug to connect to a power outlet that lacks a frame ground, ensure that the grounding wire is connected to an external ground. If not grounded, electrical shock may occur from metal surfaces or other areas of this unit.



This AC Adapter is a special part for the MEMRECAM GX-5 and should NOT be used with other devices.

1.5 HXLink

The control software HXLink is provided on a CD-ROM (Figure 1-39). Please refer to the **HXLink User's Manual** for additional details.



Figure 1-39 Control Software HXLink

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2

Basic Operations

2.1 The Flow of Operations

There are three methods to operate the MEMRECAM GX-5 are as follows.

- **J-PAD3 Remote Control**
- **HXLink Control Software**
- **External Input/Output signals**
- **Autopilot with the Sequence File on the USB Drive**

This user's manual describes operation using the **J-PAD3 Remote Control** and the **External Input/Output signals** are covered in the Specifications section.

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

Please refer to the **HXLink User's Manual** for additional details in using the HXLink control software. Please refer to / 1 / Overview / 1.2.1 – Front Panel/ Input Ourput Connector/ for additional details on the external input/output signals.

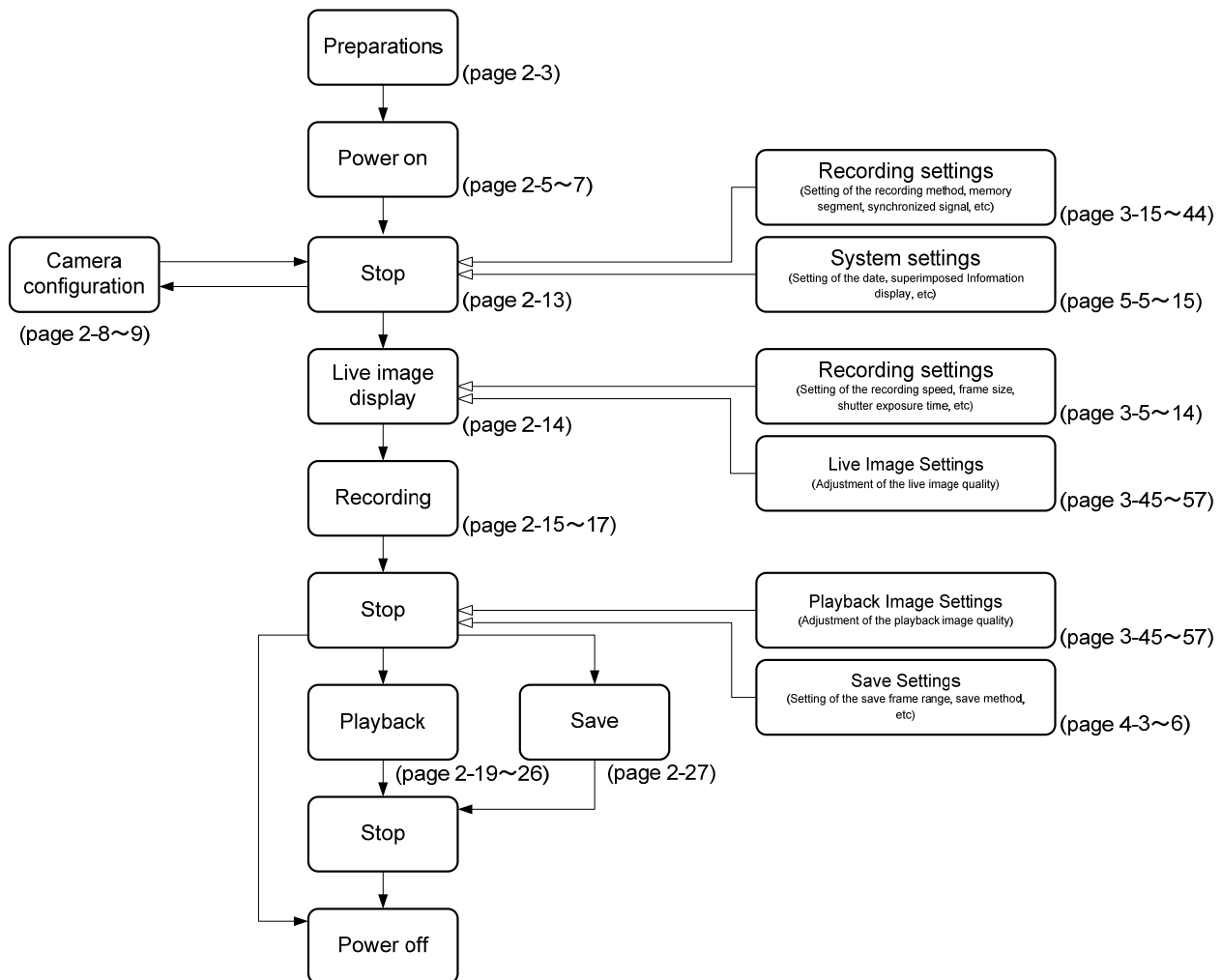


Figure 2-1 Flow of operations

2.2 Preparations

2.2.1 Connections for Each Device



Warning

Always turn the power OFF when connecting and disconnecting camera heads.
It is possible to damage the electronics and/or electric shock.

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-5 8ch DRP or MEMRECAM GX-5 4ch DRP	V-338 V-339	Standard
J1 simple cable	586396	Standard (Used ONLY with 8ch DRP)
	586392	Standard (Common GX-1)
J2 simple cable	584258	Standard (Common GX-1)
J3 simple cable	584260	Standard (Common GX-1)
AC adapter	4H1474-4	Optional (Used ONLY with 8ch DRP) (with American type AC Plug)
	4H1474-8	Optional (Used ONLY with 8ch DRP) (with Europe type AC Plug)
	585039-1	Optional (For 4ch DRP, Common GX-1) (with American type AC Plug)
	585039-3	Optional (For 4ch DRP, Common GX-1) (with loose DC cable)
Viewfinder Monitor	ZO-971	Optional
Remote control J-PAD3	CR1011	Optional
USB2.0 compatible storage media		Only FAT, FAT32 format is available. Not support NTFS and exFAT format.
Control PC		Required when using the control software HXLink.

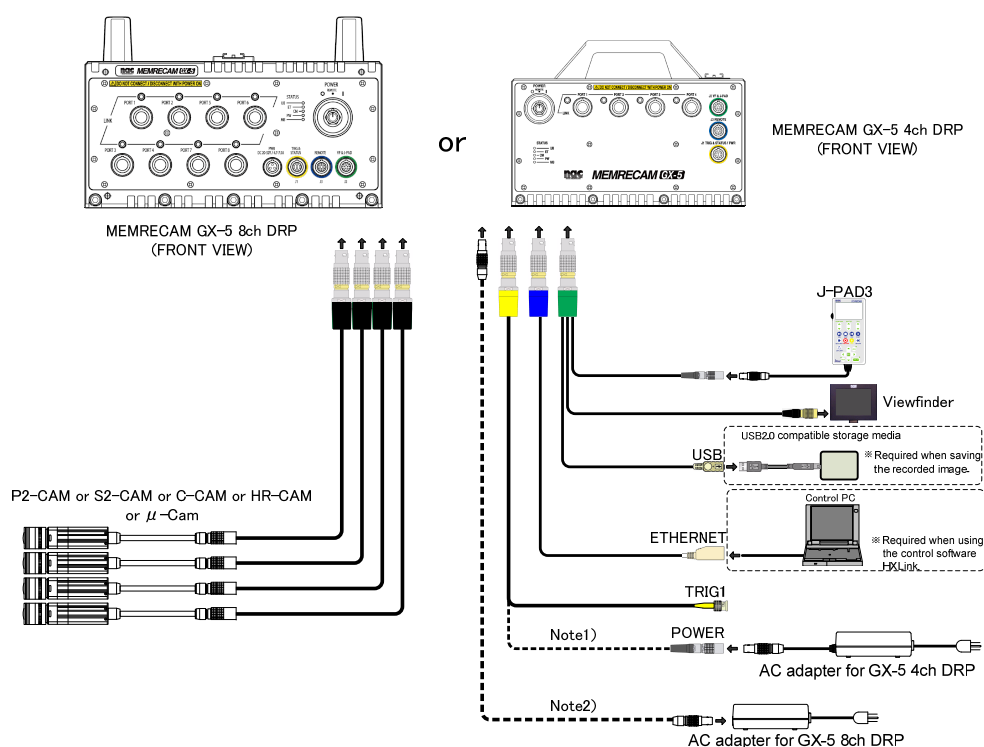


Figure 2-2 Connections for Each Device

Note 1) GX-5 4ch DRP Power Supply

There is a power input connector for the J1 cable, and power is supplied by connecting the AC adapter.

Note 2) GX-5 8ch DRP Power Supply

There is a power input connector for the front panel, and power is supplied by connecting the power cable and the AC adapter.

2.2.2 Connecting the Camera Head

First, connect the camera head to the DRP before turning the power on.

The two types of MEMRECAM GX-5 DRP include the type with 8 (8 ports) connectors for the camera head and the type with 4 (4 ports). Using multiple P2-Cam, S2-Cam, HR-Cam, C-Cam, μ -Cam units or using a mixture is acceptable (chart below).

The maximum length the camera cable can extend to is about 9m. Additionally, it can extend to a maximum of about 18m with the optional booster box.

8 Port Type (8ch DRP)

P2-Cam, S2-Cam, C-Cam, μ -Cam only	8 (max)
HR-Cam only	2 (max)
Mixture of P2-Cam, S2-Cam, C-cam, μ -Cam, HR-Cam	P2-Cam, S2-Cam, C-Cam, μ -Cam 4 (max) HR-Cam 1

4 Port Type (4ch DRP)

P2-Cam, S2-Cam, C-Cam, μ -Cam only	4 (max)
HR-Cam only	1

* If using the HR-Cam, there are four DRP ports for using four camera cables. In this case, the combinations for plugging in the camera cables into the ports is as follows.

	Available connections		Connections not available
	PORT1~4	PORT5~8	Connections other than those at the left
GX-5 8ch DRP	○	○	×
GX-5 4ch DRP	○		×

With the available connections given above, the four camera cables can be connected to any of the ports.

Caution) If using the camera configuration settings in the “Auto Configuration” mode shown in 2.4.1 and the connection is changed and the powered up, the image saved in the memory will be deleted. Make sure the connection is correct, or confirm that it is acceptable to delete the image and then turn on the power.

Save required images on USB media or on the control PC. Refer to **【2.11 Save】** or **【HXLink User’s Guide】** for the method of saving images.

Refer to **【2.4.1 Camera Configuration Mode (Auto/Manual) Selection】** for the “Auto Configuration” mode for the camera configuration settings.

2.3 Power

1. **Connect all the devices to the MEMRECAM GX-5 DRP before turning the power ON.**
2. Turn on the AC Adapter (power supply) or connect to a battery if used.
3. Turn the ON/OFF power switch ON
4. The MEMRECAM GX-5 starts up and enters STOP mode.

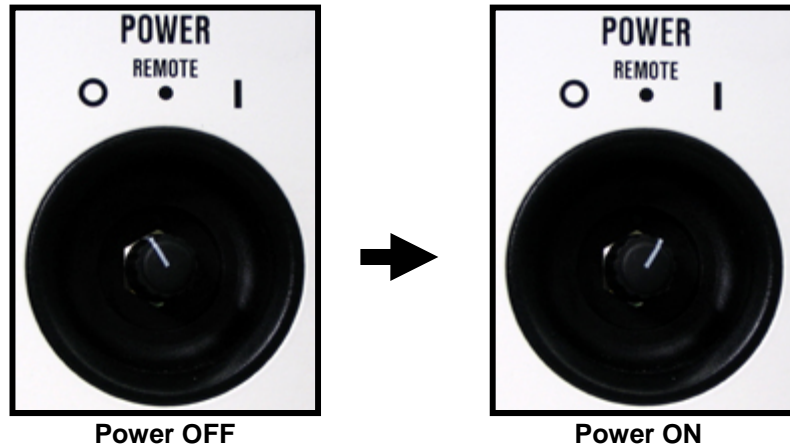


Figure 2-3 ON/OFF SWITCH

2.3.1 MEMRECAM GX-5 Startup Sequence

■ Viewfinder Image Display

1. Turn the ON/OFF power switch ON.
2. Ensure that the Viewfinder power switch is turned ON to display the *Initial Screen* (Figure 2-4).



Figure 2-4 Initial Screen

3. After a few moments, the *System Information Screen* is shown (Figure 2-5). The yellow progress bar shows the camera's diagnostics sequence status.

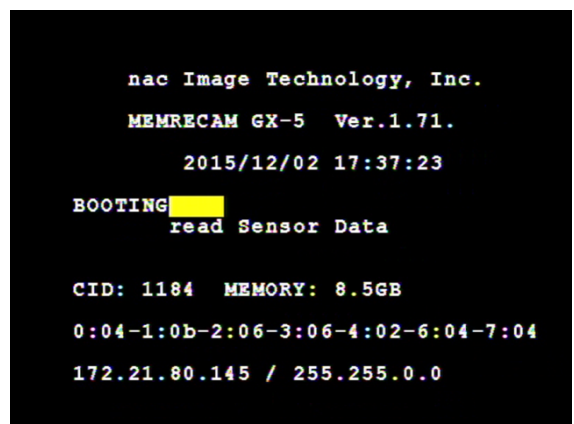


Figure 2-5 System Information Screen



Warning

It may take some time to complete the startup sequence and diagnostics. **DO NOT** turn the power OFF while the progress bar is displayed (Figure 2-5). **It is possible for the nonvolatile memory in DRP to be destroyed.**

4. After the diagnostics sequence is complete, the MEMRECAM GX-5 enters STOP mode. Nine information areas are superimposed at the top and bottom of the screen (Figure 2-6).

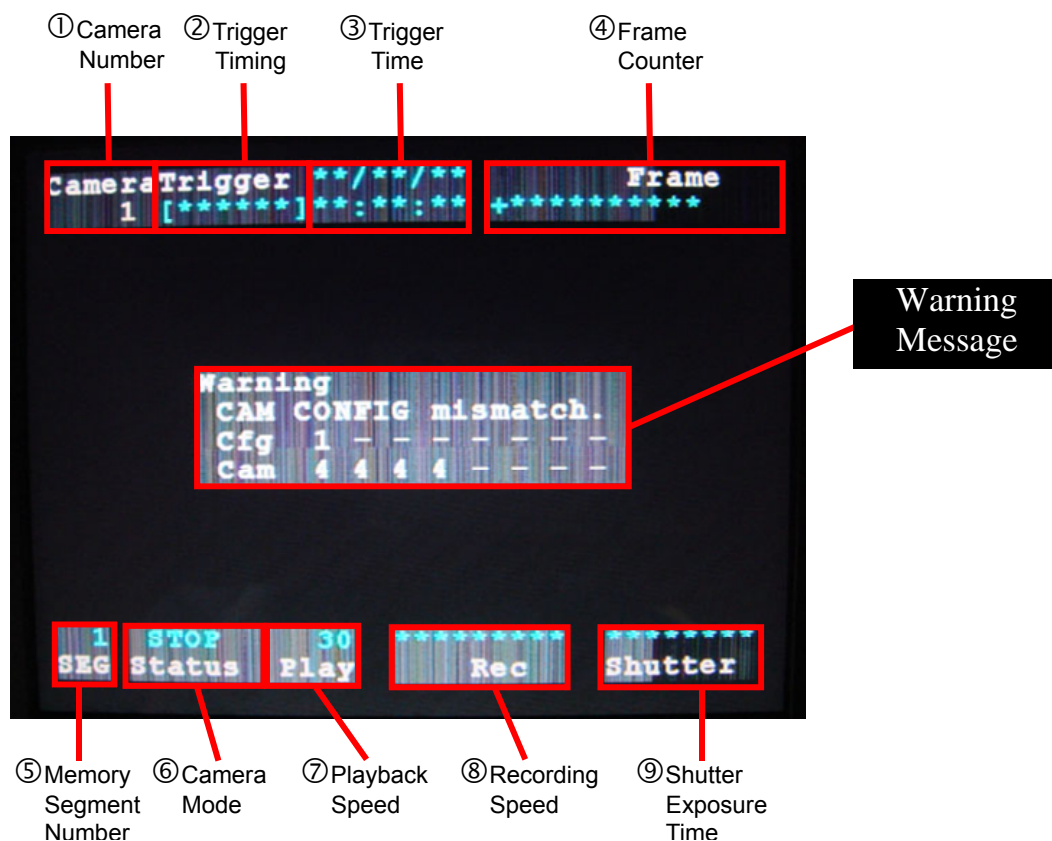


Figure 2-6 STOP Mode

When the camera configuration is correct the system is ready to be used immediately after start up.

If the configuration is different than the cameras connected to the DRP, a *Warning* message is shown. If a warning message appears set the correct camera configuration using the J-PAD3 or HXLink.

Please refer to / 2 / *Basic Operation* / 2.4 – *Camera Configuration Setting*/ for additional details on using the J-PAD3 to set the camera configuration.

Please refer to the HXLink manual on using HXLink to set the camera configuration.



If there is an image in memory being protected by the Memory Backup unit during startup, the previously recorded image is displayed. When an image has not been recorded, the image appears as in Figure 2-6

■DRP Front Panel LED Display

- 1) After turning the power ON to the MEMRECAM GX-5, the DRP front panel LED will display as shown in Figure 2-7 ① and ② until the automatic diagnostics have been completed.
- 2) Once the MEMRECAM GX-5 starts up normally and enters the STOP mode, the DRP front panel LED will display that shown in Figure 2-7 ③.

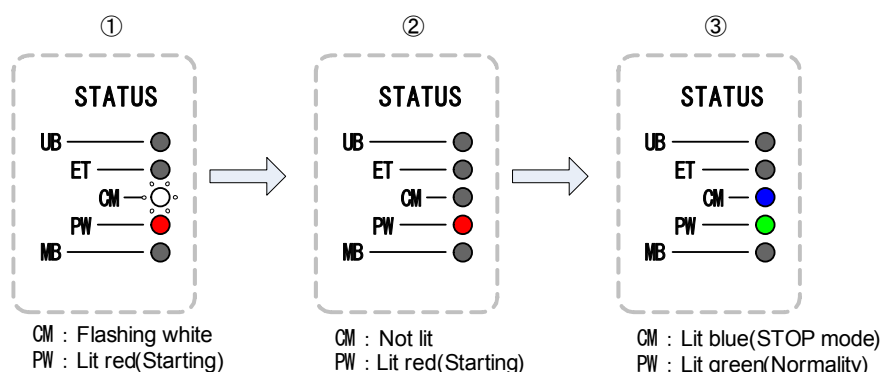


Figure 2-7 The DRP Front Panel LED Display at Startup

2.3.2 Remote Control J-PAD3 Startup

- 1) After the MEMRECAM GX-5 power has been turned on, power is supplied to the remote control J-PAD3. There is no power switch on the J-PAD3 unit.

The version information screen is shown on the J-PAD3 LCD display. (Figure2-8)



Figure 2-8 J-PAD3 version information

- 2) After a few moments, it will switch to the status screen for the STOP mode and the 13 parameters are displayed. (Figure 2-9).






	< STATUS >
① Camera mode	MODE : STOP
② Frame counter	FRAME : +0000
③ Frame time	TIME : **.*****
④ playback speed	PLAY : 30
⑤ Recording speed	FRM RATE : 1000
⑥ Frame size	FRM SIZE : 1280x960
⑦ Shutter exposure time	SHUTTER : OPEN
⑧ Trigger timing	TRIGGER : CENTER
⑨ ID number	ID : 000
⑩ Scene number	SCENE : 00000
⑪ Segment number	SEGMENT : 1
⑫ Camera number	CAMERA : 1
⑬ Playback range bar	

Figure 2-9 Status screen (STOP mode)

2.4 Camera Configuration Setup

In order to efficiently allocate system memory to each camera connected to the DRP, a camera configuration setup is required every time a camera is added or removed from use with the DRP. The port where the camera head is connected now becomes effective if the setting of the camera configuration is executed, and other ports become invalid.

Setup process for the camera configuration is shown in the following (Figure 2-10).

1. Press the MENU key  to J-PAD3, and **TOP MENU** is opened.
2. Select the **SYS MENU** in **TOP MENU**, press the SET key , and **SYS MENU** is opened.
3. Select the **SYS SET** in **SYS MENU**, press the SET key , and **SYS SET** is opened.
4. Select the **CAMCFG** in **SYS SET**, press the SET key . At this time, the message for the confirmation is displayed. Please push the SET key  again.

After the procedure mentioned above, J-PAD3 is rebooted, and the camera constitution of the system is set again.

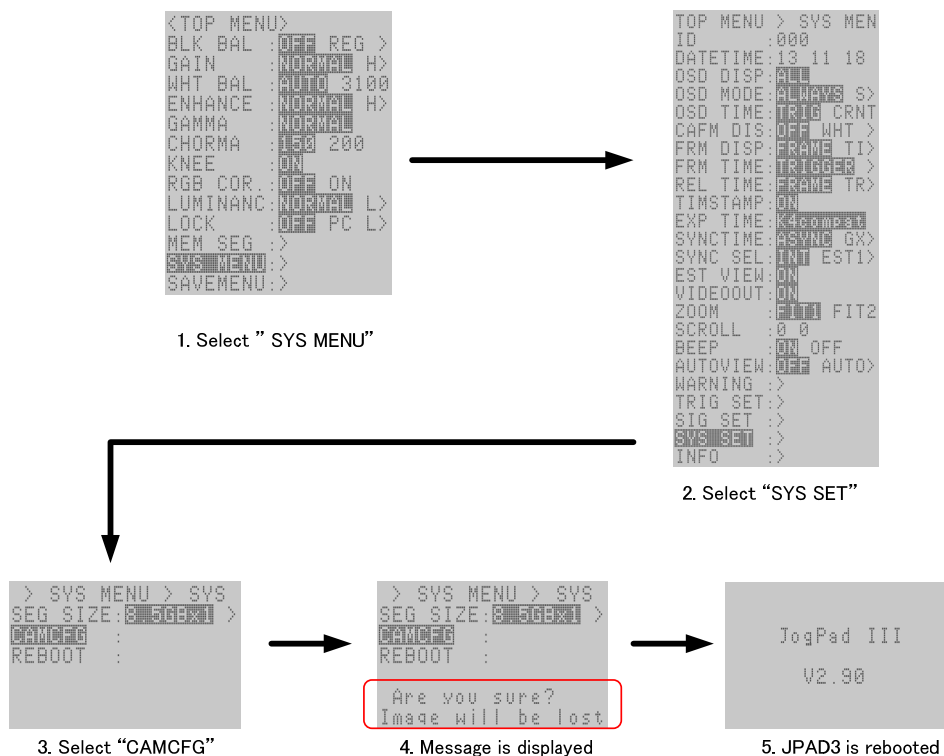


Figure 2-10 Camera Configuration Setup (J-PAD3 Display)



Important

The image recorded in the memory is destroyed by changing the camera configuration setup. Change the camera configuration only after confirming if it is an image that can be erased. Save the image in memory to an USB storage media or to a PC using HXLink before continuing. Please refer to 【2.11 Saving】 or 【HXLink manual】 for the saving method of an image.

2.4.1 Camera Configuration Mode (Auto/Manual) Selection

Auto Mode to automatically change the camera configuration with the camera head connected at DRP startup. If changing the port where the camera head is connected and the CRP is restarted, the camera configuration is updated so there is no need to conduct camera configuration with the HXLink or J-PAD3.

Caution) If the camera configuration mode is “Auto” and the recording camera configuration and the camera head connection status are different, the image data is deleted at DRP startup even if the memory backup is available. Saving image data before turning off the power to the camera is suggested when using the camera configuration mode “Auto” .



Manual Mode to change the camera configuration by manually executing the camera configuration settings (CAMCFG). Applies when not frequently changing the camera head connection position. Also, if backing up the memory, it is possible to save or download images to a PC after only starting up the DRP even if the camera head is removed.

2.4.2 Camera Configuration Detailed Settings

Function to set the camera head to be used for each port as desired. Since it is possible to set without regard to the currently connected camera head, it is possible to preset even if a camera head is not connected.

To change the settings (camera configuration mode selection and detailed settings for the camera configuration) for **【2.4.1】** and **【2.4.2】** above, the control software HXLink is required. Please refer to **【HXLink User's Guide】** for details.

2.5 Camera Head Selection and Batch Display Settings for Multiple Camera Heads

In STOP/VIEW/ARM, if the JPAD shows the status, press the left/right arrows   for items other than “TIME” to select the camera head to display the video. In this case, the currently selected camera head port number is displayed on the J-PAD3 LCD “CAMERA” item. (Figure 2-11).

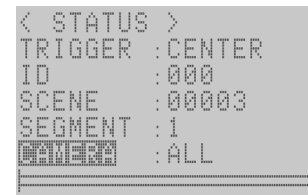


Figure 2-11 CAMERA

If there are multiple camera heads connected to the MEMRECAM GX-5 DRP, it is possible to display each camera image on the video side by side. As a result, it is possible to confirm all of the camera images when in STOP/VIEW/ARM/REC/PLAY/LOOP.

With a 4 way split display, the display is ordered from the camera with the smallest port number, with subsequent cameras displayed by switching the display.

For example, if using the MEMRECAM GX-5F 8ch DRP with 6 or 8 P2-Cam camera heads, see Tables 2-2~2-4 for the combination of displays for mixing the HR-Cam and P2-Cam or S2-Cam, or C-Cam or μ -Cam and if using the MEMRECAM GX-5 4ch DRP, the combination of displays for using 4 P2-Cam camera heads 4 is shown in Table 2-5.

Refer to 2-11 for details of the screen layout.

Table 2-2 Example using 8 camera heads (ports 1~8)

Selected Camera (Number of Port)	J-PAD3 Display (CAMERA)	Screen Layout
1	1	A
2	2	A
3	3	A
4	4	A
5	5	A
6	6	A
7	7	A
8	8	A
1,2,3,4	1234	C
5,6,7,8	5678	C
All	ALL	E

Table 2-3 Example using 8 camera heads (ports 1,2,5,6,7,8)

Selected Camera (Number of Port)	J-PAD3 Display (CAMERA)	Screen Layout
1	1	A
2	2	A
5	5	A
6	6	A
7	7	A
8	8	A
1,2,5,6	1256	C
7,8	78--	C
All	ALL	E

Table 2-4 Example using 4 camera heads (ports 1~4:HR-Cam / 5~8:P2-Cam or S2-Cam or C-Cam or μ -Cam)

Selected Camera (Number of Port)	J-PAD3 Display (CAMERA)	Screen Layout
1,2,3,4	1	A
5	5	A
6	6	A
7	7	A
8	8	A
全て	ALL	D

Table 2-5 Example using 4 camera heads (ports 1~4)

Selected Camera (Number of Port)	J-PAD3 Display (CAMERA)	Screen Layout
1	1	A
2	2	A
3	3	A
4	4	A
全て	ALL	C

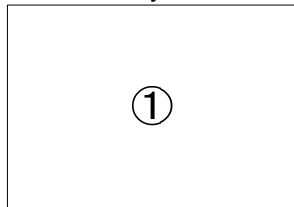
If changing the recording settings or playback settings in the status for the selected camera is “ALL”, the settings are reflected in all of the camera heads. For example, this is used if the playback range (“S.Set” and “E.Set”) for all of the camera heads are the same. However, the following limitations apply.

- (1) If the selected camera is “ALL”, the details of the settings displayed on the J-PAD3 are the settings for the camera head with the smallest port number. Since all of the camera heads are not the settings shown in the J-PAD3, it is necessary to set the value for the item after selecting “ALL” to set the same values for all of the camera heads. For example, if all of the camera head shutters are “2k”, it is necessary to sequentially select “2k” after temporarily setting “5k”, even if “2k” is displayed when selecting “ALL”.

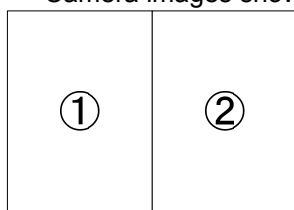
(2) Chroma, white balance, RGB matrix and black balance calculations cannot be batch set.

Also, if only non HR-Cam (P2-Cam, S2-Cam, C-Cam, μ -Cam) are connected to the GX-5 DRP, if only HR-Cam are connected or if using a combination of both, the video display screen layouts are shown in A~E as follows.

A. Screen layout when one camera is selected

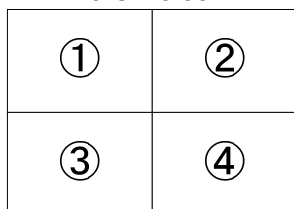


B. Screen layout when the HR-Cam2 is connected to the GX-5 8ch DRP
Camera images shown in the order of the camera number.



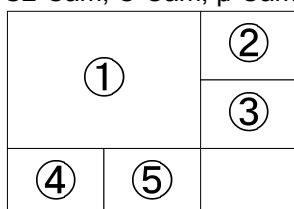
C. Screen layout when there are multiple units connected that are only non-HR-Cam (P2-Cam, S2-Cam, C-Cam, μ -Cam)

The GX-5 4ch DRP displays the camera image in the location corresponding to the port number.
The GX-5 8ch DRP displays in the order of the camera numbers.



D. Screen layout when there is a mixture of HR-Cam and others (P2-Cam, S2-Cam, C-Cam, μ -Cam) connected to the GX-5 8ch DRP

The camera image for the HR-Cam is displayed in ① while the camera images for the others (P2-Cam, S2-Cam, C-Cam, μ -Cam) are displayed in ②~⑤ according to the port numbers.




E. Screen layout when there are five connections to the GX-5 8ch DRP that are not HR-Cam (P2-Cam, S2-Cam, C-Cam, μ -Cam)
The camera images are displayed in the locations corresponding to the port numbers.

①	②	③
④	⑤	⑥
⑦	⑧	



2.6 Stop (STOP Mode)

■Switching to STOP Mode

Press the STOP  button.

The MEMRECAM GX-5 normally starts up in the STOP mode. If operating in any modes other than STOP press the STOP  button to stop operation and return to STOP mode.

Recording, playback and storage settings are configured while in STOP mode. Refer to **[3 Recording and Playback Settings]** and **[4 Save Settings]** for additional details.

By pressing the right and left keys   it is possible to switch between cameras when two or more cameras are connected.

■Image Display

When the MEMRECAM GX-5 is first turned on the DRP enters STOP mode automatically after the startup sequence is complete. Nine information areas are superimposed at the top and bottom of the screen. The [Status] information box shows that the DRP is in **STOP** mode.

The superimposed information displayed in blue is information related to the image saved in the memory or playback information. "*" are shown when the memory is empty.

The memory segment number [SEG] and the playback speed [Play] are shown whether or not there is an image recorded in memory.

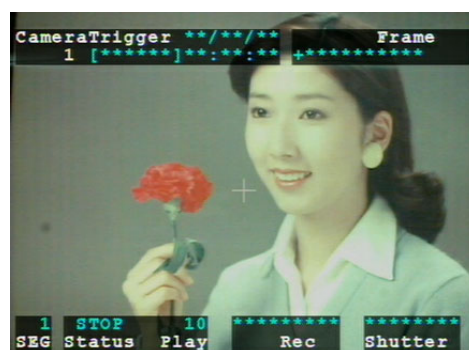


Figure 2-12 Image Display [STOP] mode



Important

If there is an image in memory being protected by the Memory Backup unit during startup, the previously recorded image is displayed after startup.

■J-PAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **STOP** mode as in Figure 2-12. After startup, if the memory is empty, the factory default settings are shown on the <STATUS> screen. Since [TIME] information cannot be determined until recording has ended "*" are shown. In addition the range bar is empty because there because there is no image in memory.

```
< STATUS >
MODE      : STOP
FRAME     : +0000
TIME      : 21.618993
PLAY      : 30
FRM RATE  : 1000
FRM SIZE  : 640x480
SHUTTER   : OPEN
TRIGGER   : CENTER
ID        : 000
SCENE     : 000001
SEGMENT   : 1
CAMERA    : 1
```

Figure 2-13 J-PAD3 Display <STOP> mode


■Front Panel LED Display

During the STOP mode, the CM LED lights up blue.



2.7 Live Image Display (VIEW Mode)

■ Switching to VIEW mode

Press the VIEW/ARM  button.

VIEW mode can be accessed by pressing the VIEW/ARM  button while in STOP mode.

The Record Settings are configured while in VIEW mode. Refer to [3 Recording and Playback Settings] for additional details.

By pressing the right and left keys   it is possible to switch between cameras when two or more cameras are connected.

■ Image Display

When the MEMRECAM GX-5 is in VIEW mode, the live image is shown on the video monitor (optional). The [STATUS] information box shows that the DRP is in **VIEW** mode (Figure 2-14).

The superimposed information in red shows the current record settings for the trigger [Trigger], frame rate [Rec] and shutter speed [Shutter]. If the record settings are changed, the live image and the superimposed information also changed.

The superimposed information for the trigger time and frame counter remain unchanged from the way they were in STOP mode.

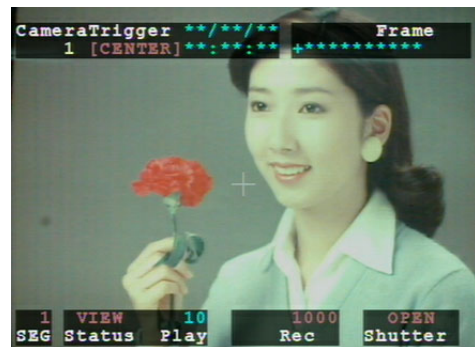


Figure 2-14 Image Display [VIEW] mode

■ J-PAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **VIEW** mode as in Figure 2-15. The current record settings are also shown. If the recording conditions are changed the JPAD 3 <STATUS> information is also changed.

The JPAD 3 <STATUS> information for the frame counter [FRAME] and frame time [TIME] remain unchanged from the way they were in STOP mode.

Since [TIME] information cannot be determined until recording has ended "*" are shown.

```
< STATUS >
MODE      :VIEW
FRM RATE  :1000
FRM SIZE  :640x480
SHUTTER   :OPEN
TRIGGER    :CENTER
ID         :000
SCENE     :000001
PLAY       :30
FRAME     :+0000
TIME      :13/11/25
SEGMENT    :1
CAMERA     :1
```

Figure 2-15 J-PAD3 Display <VIEW> mode

■ Front Panel LED Display

During the VIEW mode, the CM LED lights up white.

2.8 Recording

The MEMRECAM GX-5 memory is comprised of a ring buffer (circular memory) where the first recorded image and the last recorded image are connected while being stored to memory. When the recording starts the images are photographed and sequentially stored in the ring buffer (circular memory). After the ring buffer completes one cycle, each subsequent new image is overwritten. The images continue to be overwritten until the Trigger signal is received and the recording sequence is completed.

Change the camera modes using the remote control J-PAD3 (Figure 2-16) to perform a recording sequence.

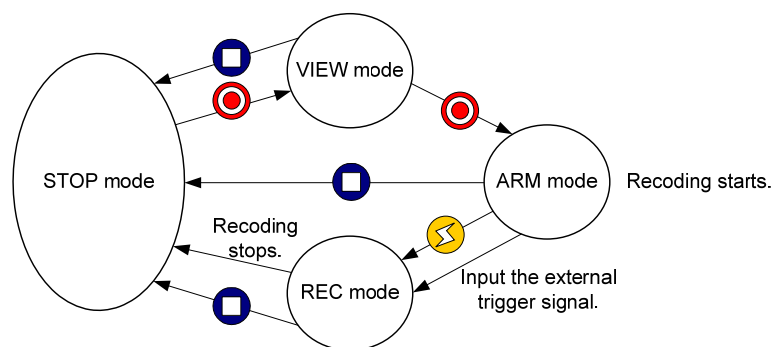


Figure 2-16 J-PAD3 Record operation summary

2.8.1 ARM Mode




Warning



Before switching to ARM mode verify that the image stored in memory can be erased. Immediately upon switching to ARM mode the image stored in memory is overwritten by the new image being captured. Save the image in memory to a USB storage media or to a PC using HXLink before continuing. Please refer to 【2.11 Saving】 or 【HXLink manual】 for additional information on saving images.

■ Switching to ARM Mode

Press the VIEW/ARM  button.

From VIEW mode, ARM mode can be accessed by pressing the VIEW/ARM  button on the J-PAD3.

While in ARM mode the Record Settings cannot be changed.

By pressing and the right and left key   it is possible to switch between cameras when two or more cameras are connected.

■ Image Display

When the MEMRECAM GX-5 is in ARM mode, the image being recorded is shown on the video monitor (optional). The [STATUS] information box shows that the DRP is in **ARM** mode (Figure 2-17).

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

After the trigger signal is received the frame number of the frame being saved is displayed in frame [Frame] information box. Depending on the trigger [Trigger] setting the amount of frames remaining to be recorded after the trigger signal change. Refer to 【3.2.1 Trigger Timing Selection】for additional details.

Since [TIME] information cannot be determined until recording has ended “*” are shown.

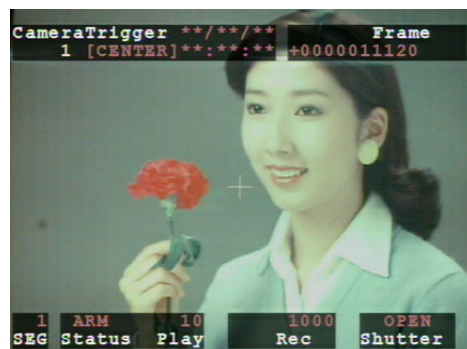


Figure 2-17 Image Display [ARM] mode

■ J-PAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **ARM** mode as in Figure 2-18. The record settings configured while in <VIEW> mode are shown. Record settings cannot be changed while in ARM mode.

Since [TIME] information cannot be determined until recording has ended “*” are shown. In addition "0" is shown for the frame counter <FRAME> until recording has ended.

```
< STATUS >
MODE      : ARM
FRM RATE  : 1000
FRM SIZE  : 640x480
SHUTTER   : OPEN
TRIGGER   : CENTER
ID        : 000
SCENE     : 00001
PLAY      : 30
FRAME     : +0000
TIME      : **/**/**
SEGMENT   : 1
CAMERA    : 1
```

Figure 2-18 J-PAD3 Display <ARM>


■ Front Panel LED Display

During the ARM mode, the CM LED lights up magenta.

2.8.2 REC Mode

■Switching to REC Mode

Press the TRIG  button - or - an external trigger input signal is received

From ARM mode, REC mode can be accessed by pressing the TRIG  button or an external trigger signal is received on the J1 cable, TRIG1 branch. Refer to **[3.2.9 External Trigger Signal Selection]** for additional information on external trigger inputs.

Once in REC mode, the recording ends according to the set trigger timing. Refer to **[3.2.1 Trigger Timing Selection]** for additional details on trigger timing.

Once the recording ends, the unit automatically returns to STOP mode.

■Image Display

When the MEMRECAM GX-5 is in REC mode, the image being recorded is shown on the video monitor (optional). The [STATUS] information box shows that the DRP is in **REC** mode (Figure 2-19).

After the trigger signal is received the frame number of the frame being saved is displayed in frame [Frame] information box. Depending on the trigger [Trigger] setting the amount of frames remaining to be recorded after the trigger signal change. Refer to **[3.2.1 Trigger Timing Selection]** for additional details.

Since [TIME] information cannot be determined until recording has ended “*” are shown.

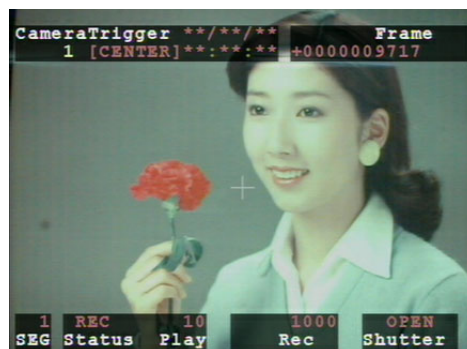


Figure 2-19 Image Display [REC] mode

■J-PAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **REC** mode as in Figure 2-20. The record settings configured while in <VIEW> mode are shown. Record settings cannot be changed while in ARM mode.

Since [TIME] information cannot be determined until recording has ended “*” are shown. In addition "0" is shown for the frame counter <FRAME> until recording has ended.

```
< STATUS >
MODE      :REC
FRM RATE  :1000
FRM SIZE  :640x480
SHUTTER   :OPEN
TRIGGER    :CENTER
ID         :000
SCENE     :00001
PLAY      :30
FRAME     :+0000
TIME      :**/**/**
SEGMENT   :1
CAMERA    :1
```

Figure 2-20 J-PAD3 Display <REC> mode

■Front Panel LED Display

During the REC mode, the CM LED lights up orange.

2.9 Memory Backup

Once recording ends, the unit automatically returns to STOP mode. At the same time, the memory backup function activates (Figure 2-21). The status of the memory backup can be verified by the rear panel LED display (Table 2-2). Therefore, in the event that the external power is cut off after the recording is complete, the images saved in the memory are preserved (Figure 2-22). The memory backup function does not operate the camera while recording.

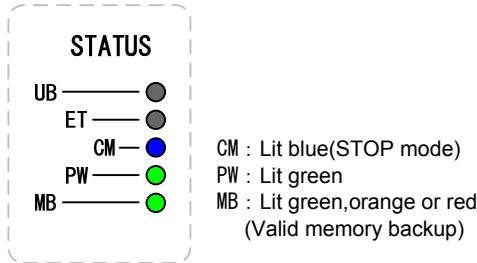


Figure 2-21 Memory Backup with External Power

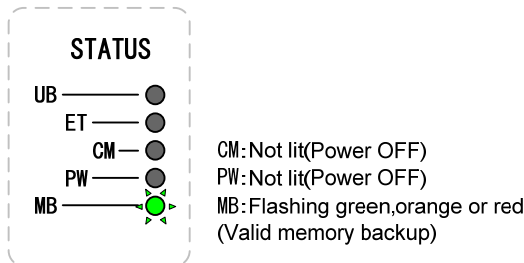


Figure 2-22 Memory Backup without External Power

Table 2-2 Memory Backup Status Display with MB LED

MB LED (Memory Backup)	GREEN (Lit) with External Power	Valid memory backup, Charge: High
	GREEN (Flashing) with Battery Power	Valid memory backup, Charge: High
	Orenge (Lit) with External Power	Valid memory backup, Charge: Medium
	Orenge (Flashing) with Battery Power	Valid memory backup, Charge: Medium
	RED (Lit) with External Power	Valid memory backup, Charge: Low (backing up with External Power)
	RED (Flashing) with Battery Power	Valid memory backup, Charge: Low (backing up with Battery)
	Not lit	No memory backup data



Important

The amount of charge is impacted by differences in the batteries and ambient temperature. Use the LED indications only as a guide since it may not be precise.



Warning

If the LED color turns from **Flashing ORANGE** to **Flashing RED** during battery backup, charge the battery as soon as possible! If the battery is not charge, the battery backup function will de-activate and the images will be lost!

Connect the MEMRECAM GX-5 DRP to a reliable external power source (e.g. AC adapter). **Do not rely on an external battery power source.**

2.10 Playback

Recorded images can be played back as follows:

- **PLAY Mode** - Single sequence playback
- **LOOP Mode** - Loop playback
- Playback at **Varying Speeds**
- **Skip Forward / Fast Forward / Rewind**
- **Frame Jumping**
- Set **Playback Range**

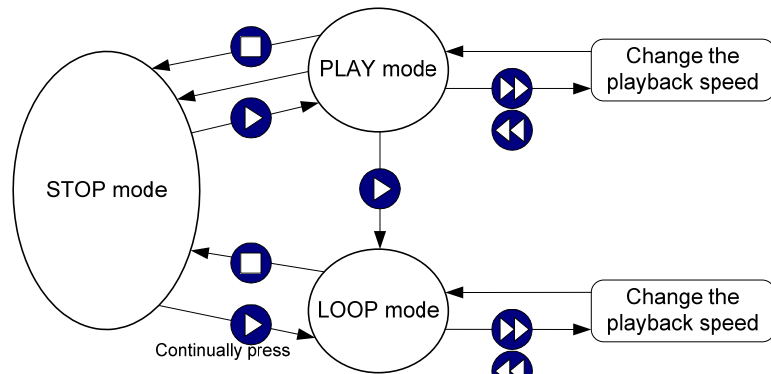


Figure 2-23 J-PAD3 Playback operation summary

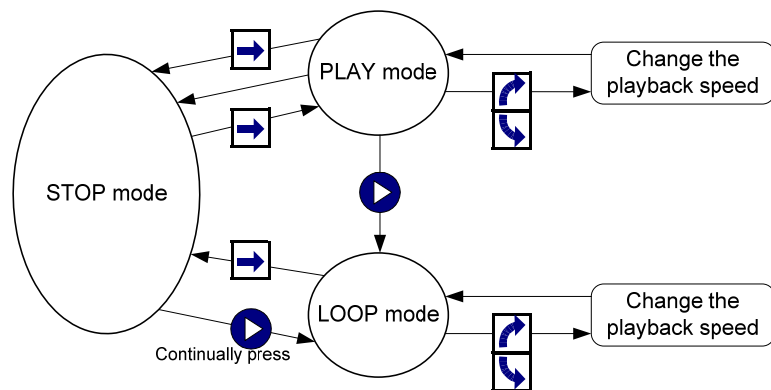
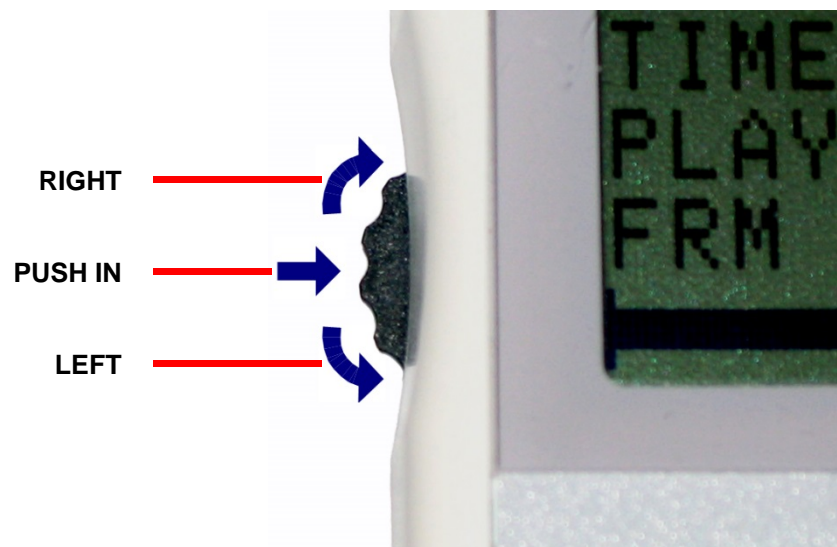





Figure 2-24 J-PAD3 Playback operation summary (using the dial)




2.10.1 PLAY Mode - Single Sequence Playback

■ Switching to PLAY mode

Press the PLAY  button - or - push  the Dial in

From STOP mode, PLAY mode can be accessed by pressing the PLAY  button or pushing  the dial in. Recorded images are played back sequentially. With Single Sequence Playback mode the images within a range are shown one time. When it reaches the end of the range the unit automatically returns to STOP mode.

To exit PLAY mode press the STOP  button or wait until the image sequence reached the end.

■ Image Display

While in PLAY mode, the recorded image is played back sequentially. The [STATUS] information box shows that the DRP is in **PLAY** mode (Figure 2-25). The [Frame] information box shows the frame number for each image.

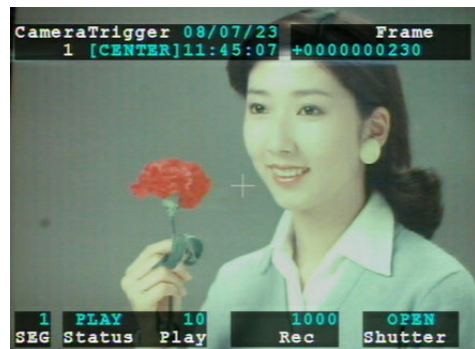


Figure 2-25 Image Display [PLAY] mode

■ J-PAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **PLAY** mode as in Figure 2-26. The record settings used while recording the image are shown.

<FRAME> shows the frame number for each image.
<TIME> shows the recording time for each image.

While in PLAY mode the playback range bar is shown at the bottom of the <STATUS> display. A mark shows the position of the current frame in relation to the playback range.

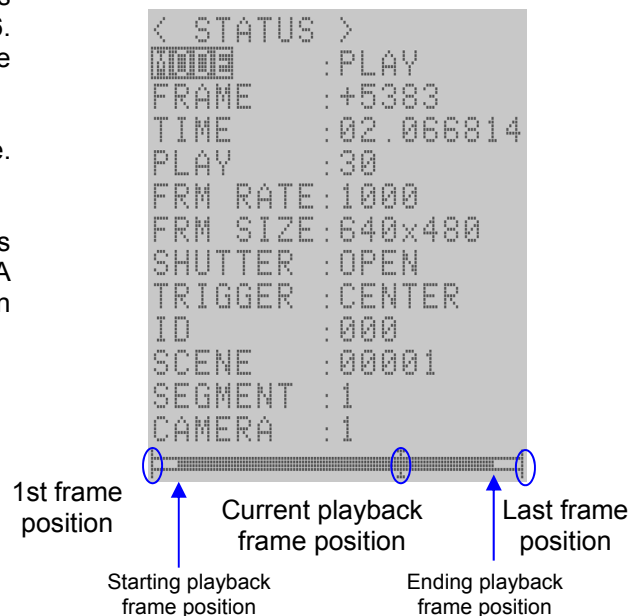






Figure 2-26 J-PAD3 Display <PLAY> mode

2.10.2 LOOP Mode - Loop Playback

■ Switching to LOOP mode

Hold down the **PLAY**  button – or – press the **PLAY**  button twice

From STOP mode, LOOP mode can be accessed by holding down the **PLAY**  button or pressing the **PLAY**  button twice. The Recorded images are played back continuously in a loop. If a playback range has been set, only the portion of the image within the range is played back continuously in a loop.

To stop loop playback, press the **STOP**  button or push  the dial in.

■ Image Display

While in LOOP mode, the recorded image is played back in a loop. The [STATUS] information box shows that the DRP is in LOOP mode (Figure 2-27). The [Frame] information box shows the frame number for each image.

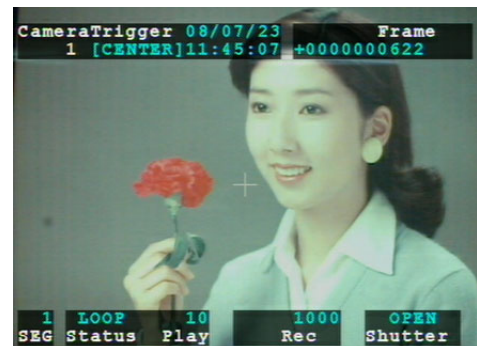


Figure 2-27 Image Display [LOOP] mode

■ J-PAD3 Display

In the JPAD 3 <STATUS> display, <MODE> shows that the DRP is in **LOOP** mode as in Figure 2-28. The record settings used while recording the image are shown.

<FRAME> shows the frame number for each image.
<TIME> shows the recording time for each image.

While in PLAY mode the playback range bar is shown at the bottom of the <STATUS> display. A mark shows the position of the current frame in relation to the playback range. When the mark reaches the end of the range it jumps to the beginning of the range.

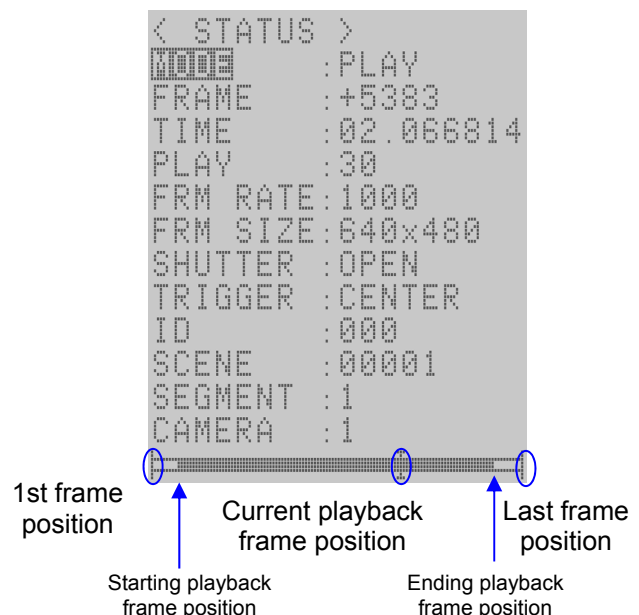


Figure 2-28 J-PAD3 Display <LOOP> mode

2.10.3 Playback at Varying Speeds









While in **PLAY** or **LOOP** mode, press the **REV**  - or - **FWD**  buttons to change the playback speed (Figure 2-22, 23). Each operation is shown in Table 2-3.

Table 2-3 Changing Playback Speeds

Playback Speed Change	J-PAD3 Button Operation
(Forward) Slow Down (Reverse) Speed Up (Forward) go in Reverse	While in Forward playback press REV  to slowdown the image playback While in Reverse playback press REV  to speedup the image playback While in Forward playback press REV  several times to play the image backwards (Reverse)
(Reverse) Slow Down (Forward) Speed Up (Reverse) go Forward	While in Reverse playback press FWD  to slowdown the image playback While in Forward playback press FWD  to speedup the image playback While in Reverse playback press FWD  several times to play the image backwards (Reverse)

The available playback speeds can vary depending on the video output. Table 2-4 shows the playback speeds for NTSC and PAL video outputs. Refer to **[5 System Setting]** for additional details on setting the video output.

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

2.10.4 Skip Forward, Fast Forward, Skip Backward and Rewind












While in STOP mode press the **REV**  - or - **FWD**  buttons or turn the dial to the **RIGHT**  or **LEFT**  to Skip Forward, Fast Forward, Skip Backward and Rewind. Table 2-5 shows each operation.

Table 2-5 Skip Forward, Fast Forward, Skip Backward and Rewind

Operation	JPAD 3 Button Operation	J-PAD3 Dial Operation
Skip Forwards	Press the FWD  button once.	Turn dial to the RIGHT 
Skip Backwards	Press the REV  button once.	Turn dial to the LEFT 
Fast Forward	Hold down the FWD  button Release to stop.	Push the dial while turning to the RIGHT  + 
Rewind	Hold down the REV  button Release to stop.	Push the dial while turning to the LEFT  +  Release to stop.

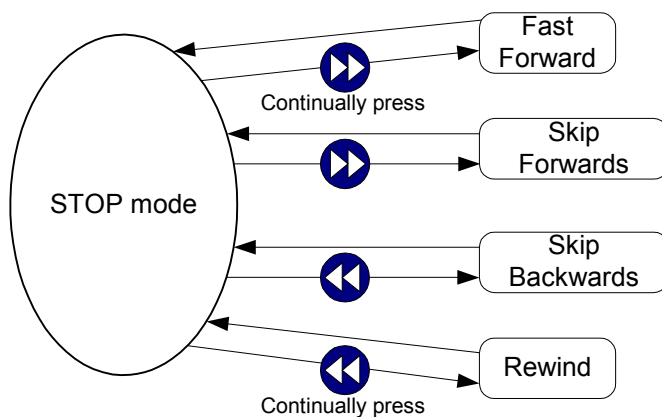


Figure 2-29 Skip Forward, Fast Forward, Skip Backwards and Rewind using the J-PAD3

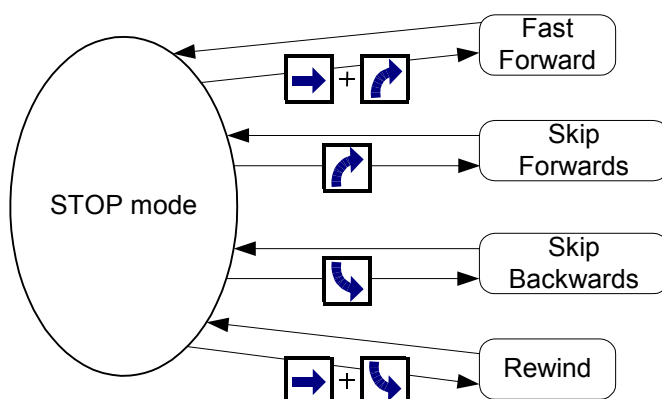


Figure 2-30 Skip Forward, Fast Forward, Skip Backwards and Rewind using the J-PAD3 dial

2.10.5 Frame Jumping

While in STOP mode press the **TRIG** ⚡, **REV** ⏮, **FWD** ⏭ buttons or turn the dial to the **RIGHT** ⏪ or turn the dial to the **LEFT** ⏩ to jump to a particular frame. The operation to Jump to a Frame is shown in Table 2-6.

Table 2-6 Frame Jumping

Jump to	J-PAD3 Button Operation	J-PAD3 Dial 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.

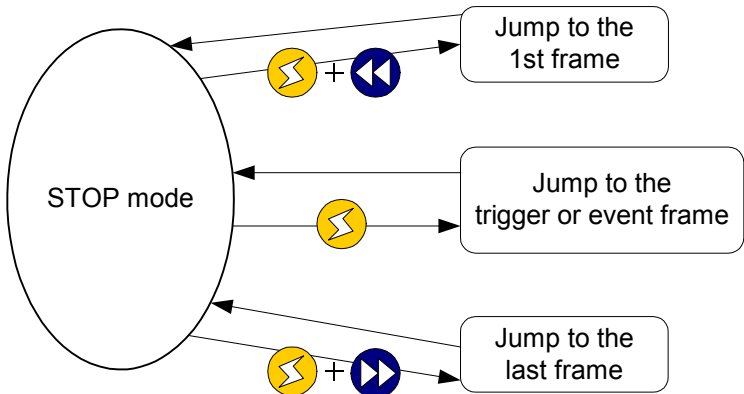


Figure 2-31 Frame Jumping Using the J-PAD3

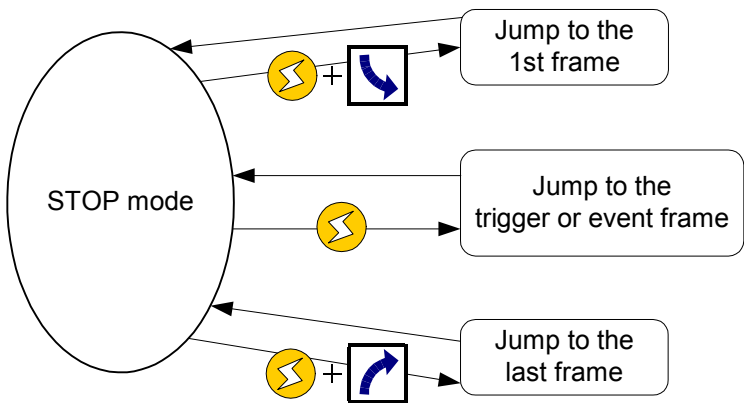


Figure 2-32 Frame Jumping Using the J-PAD3 (Using the Dial)

2.10.6 Setting the Playback Range

While in **STOP** mode press the **S.SET** (⏮) , **E.SET** (⏭) buttons to set the Starting and Ending playback range. As an alternative press the **STOP** (⏹) and turn the dial to the **RIGHT** (⏪) or **LEFT** (⏩) to set the playback range. The operations to set the Starting and Ending playback range are shown in Table 2-7.

Table 2-7 Playback Range Settings

Jump to	J-PAD3 Button Operation	J-PAD3 Dial 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	Press and hold down S.SET (⏮)	
Delete ending playback frame	Press and hold down E.SET (⏭)	
Delete playback range		Press STOP (⏹) while pushing the dial (⏪) in.

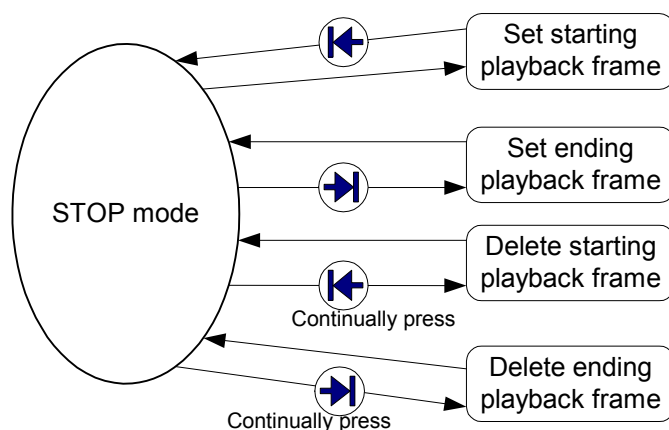


Figure 2-33 Playback Range Settings Using the J-PAD3

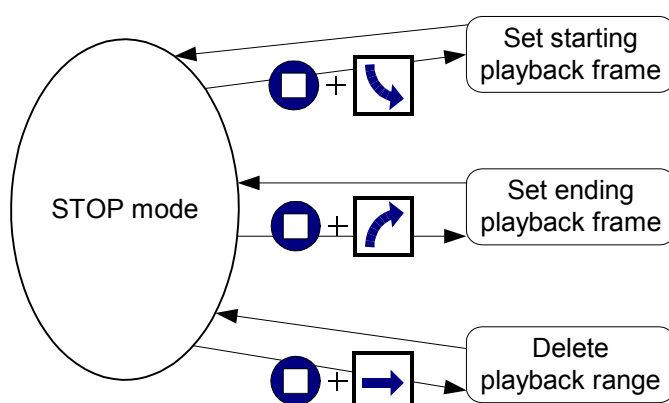


Figure 2-34 Playback Range Settings Using the J-PAD3 (Using the Dial)

■ Playback Range – Video Display

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

- 1) While in **STOP** mode, search for the start frame by pressing the **FWD** ⏩ or **REV** ⏪ buttons.
- 2) To set the starting frame, press the **S.SET** ⏮ button. As an alternative press the **STOP** ⏹ and turn the dial to the **LEFT** ⬅. The video display will show **[Frame** to indicate that the starting frame has been set. Press and hold down the S.SET ⏮ button to delete the playback range setting.

The video display shows the text **[Frame** in white and **-0000000318** in green on a black background.

- 3) While in **STOP** mode, search for the end frame by pressing the **FWD** ⏩ or **REV** ⏪ buttons.
- 4) To set the end frame, press the **E.SET** ⏭ button. As an alternative press the **STOP** ⏹ and turn the dial to the **RIGHT** ➡. The video display will show **[Frame]** to indicate that the starting frame has been set. Press and hold down the E.SET ⏭ button to delete the playback range setting.

The video display shows the text **[Frame]** in white and **+0000000373** in green on a black background.

■ Playback Range – J-PAD3 Display

The playback range that has been set appears as a black region within the playback range bar on the J-PAD3 <STATUS> screen (Figure 2-35).

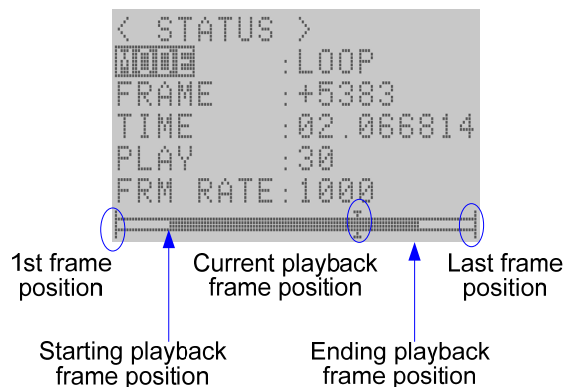


Figure 2-35 J-PAD3 Display (During Playback Range Loop Playback)

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

■ Playback of Frames outside of the Playback Range

After setting the playback range it is possible to view the frames outside the Set Playback Range by pressing the **FWD** ⏩ or **REV** ⏪ while in **STOP** mode.

If viewing an image before the set Start frame the frame counter shows **< Frame]** indicating that the image is beyond the beginning of the range.


The video display shows the text **<Frame]** in white and **-0000000322** in green on a black background.


If viewing an image after the set Start frame the frame counter shows **[Frame >** indicating that the image is beyond the end of the range.

The video display shows the text **[Frame >** in white and **+0000000376** in green on a black background.

2.11 Saving

Recorded images can be saved on FAT or FAT32 format USB storage media for each camera or as a batch for all cameras.


Connect the recording media to the J2 cable USB connector. Select the camera for saving on the the J-PAD3 STATUS screen or select ALL and press download  to display the save mode screen (Figure 3-36).

Press SET  to save the images for the camera playback range displayed in the video as a video file (MCFF).

If displaying camera images for one camera on the video, only those camera images are saved.
If displaying all camera images on the video, (J-PAD3 STATUS screen camera ALL), all of the camera images will be sequentially saved.

Refer to **【4 Save Settings】** for details of the SAVE MENU settings relating to saving.

Caution) • USB recording media with NTFS or exFAT format cannot be used.

- If displaying camera images with the 4-way display when using five or more cameras on the GX-5 8ch DRP, the save mode cannot be accessed even if
DOWNLOAD  is pressed.

- 1) Press J-PAD3 DOWNLOAD  to display the save mode screen (Figure 2-36).

At START, the start playback frame number is displayed.

At END, the end playback frame number is displayed.

If batch saving for all cameras, astericks will be displayed if the start playback and end playback for all cameras do not match (Figure 2-37).

For images block partitioned with multi trigger recording, the block number is displayed to the left of the start playback (START) • end playback (END) (Figure 2-38).

「SAVE?」 「SET」 flashes to prompt the start of the save.

- 2) Press J-PAD3 SET  to start the save.

If the save has started, the save file name is displayed in FILE (Figure 2-39). Example) 「MCFF0000.MCF」

If batch saving all cameras, the file is saved in each camera so when the save for the next camera file save starts, +1 is added to the displayed file name.

A progress bar is displayed at the bottom of the screen to show the status of the save for the camera.

- 3) Once the image is saved, the 「SAVE?」 display will switch to 「COMPLETE」 and 「SET」 will flash (Figure 2-40) .

- 4) Press J-PAD3 SET  to end the save mode.

- 5) Remove the storage media after confirming that the recording media access light isn't lit. The USB LED on the front panel will go out.

Caution) Saved video files (MCFF) cannot be reloaded to the MEMRECAM GX-5 DRP. Saved video files (MCFF) can be played back with the control software for the HXLink.

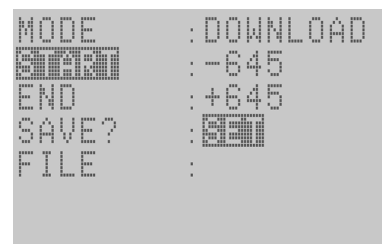


Figure 2-36 Save mode screen



Figure 2-37 Save mode screen



Figure 2-38 Block number display



Figure 2-39 Start download

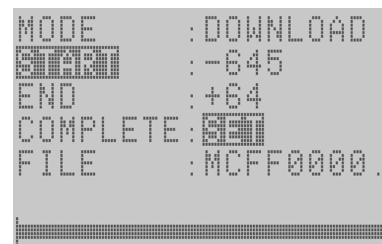


Figure 2-40 End download

(Blank Page)

3

Recording and Playback Settings


3.1 Settings

The J-PAD3 remote control can be used to set various recording and playback settings. There are three menu groups to enter these settings.



- TOP MENU
- SYS MENU
- VIEW MENU

3.1.1 TOP MENU Settings

■ Switching to the TOP MENU

From STOP mode, press the MENU  button to switch from the <STATUS> screen to the <TOP MENU> (Figure 3-1).

■ Exit the TOP MENU

Press STOP  or MENU  to return to the <STATUS> screen (STOP mode).

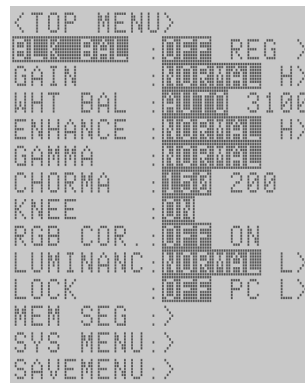


Figure 3-1 TOP MENU




Table 3-1 TOP MENU Settings

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




3.1.2 SYS MENU Settings

■ Switching to the SYS MENU

From STOP mode, press the MENU  button to switch from the <STATUS> screen to the <TOP MENU>.

Use the UP/DOWN   arrows to select <SYS MENU> press SET  to display the SYS MENU (Figure 3-2).

■ Exit the SYS MENU

Press STOP  or MENU  to return to the <STATUS> screen (STOP mode). It is possible to return to the <TOP MENU> by selecting <TOP MENU> > SYS MEN> at the top of the SYS MENU and pressing SET .

```

TOP MENU > SYS MEN
ID :000
DATETIME:13 11 18
OSD DISP:ALL
OSD MODE:ALWAYS S>
OSD TIME:TRIG CRNT
CAFM DIS:OFF WHT >
FRM DISP:FRAME TI>
FRM TIME:TRIGGER >
REL TIME:FRAME TR>
TIMESTAMP:ON
EXP TIME:K4compst
SYNCTIME:ASYNC GX>
SYNC SEL:INT EST1>
EST VIEW:ON
VIDEOOUT:ON
ZOOM :FIT1 FIT2
SCROLL :0 0
BEEP :ON OFF
AUTOVIEW:OFF AUTO>
WARNING :>
TRIG SET:>
SIG SET :>
SYS SET :>
INFO :>

```


Table 3-2 SYS MENU Settings

Figure 3-2 SYS MENU



Settings	Setting Details	
ID	ID number setting	Refer to Chapter 【5 System Settings】
DATETIME	Date and time setting	Refer to Chapter 【5 System Settings】
OSD DISP	Display/do not display superimposed information	Refer to Chapter 【5 System Settings】
OSD MODE	Display/do not display superimposed information by camera mode	Refer to Chapter 【5 System Settings】
OSD TIME	Trigger time display setting	Refer to Chapter 【5 System Settings】
CAFM DIS	Display/do not display mark for center of image	Refer to Chapter 【5 System Settings】
FRM DISP	Frame counter display setting	Refer to Chapter 【5 System Settings】
FRM TIME	Frame time standard setting	Refer to Chapter 【5 System Settings】
REL TIME	Relative time display settings	Refer to Chapter 【5 System Settings】
TIMESTAMP	Time stamp record setting	Refer to this Chapter
EXP TIME	Exposure timing setting	Refer to this Chapter
SYNC TIME	Synchronized time setting	Refer to this Chapter
SYNC SEL	Synchronized signal setting	Refer to this Chapter
EST VIEW	Synchronization settings for the VIEW mode during external synchronization	Refer to this Chapter
VIDEOOUT	Display/do not display image	Refer to Chapter 【5 System Settings】
ZOOM	Zoom playback image	Refer to this Chapter
SCROLL	Scroll playback image	Refer to this Chapter
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	Refer to this Chapter
SIG SET	External input/output signal polarity setting	Refer to this Chapter
SYS SET	Segment memory setting, reboot	Refer to this Chapter
	Camera Configuration Setup	Refer to Chapter 【2 Basic Operations】
	System reboot	Refer to Chapter 【5 System Settings】
INFO	System information display (cannot be set)	Refer to Chapter 【5 System Settings】

3.1.3 VIEW MENU Settings

■ Switching to VIEW MENU

From VIEW mode, press the MENU  button to switch from the <STATUS> screen to the <VIEW MENU> (Figure 3-3).

■ Exit VIEW MENU

Press STOP  or MENU  to return to the <STATUS> screen (VIEW mode).

```

<VIEW MENU>
SCENE : 000000
TRIGGER : CENTER E>
FRM RATE : 000 1500
FRM SIZE : 280x960>
CUSTOM F :>
SHUTTER : OPEN 2k >
LOWLIGHT : 00 250 >
GAIN : NORMAL H>
WHT BAL : AUTO 3100
ENHANCE : NORMAL H>
GAMMA : NORMAL
CHROMA : 150 200 >
KNEE : ON
RGB COR. : OFF ON
LUMINANC : NORMAL L>
DEPTH : 10
ZOOM : FIT2
SCROLL : 0 0
  
```

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
LOWLIGHT	Low light mode setting	
GAIN	Gain adjustment of live image	
WHT BAL	White balance of live image	
ENHANCE	Enhance correction of live image	
GAMMA	Gamma correction of live image	
CHROMA	Chroma adjustment of live image	
KNEE	Knee adjustment of live image	
RGB COR.	RGB matrix settings of live image	
LUMINANC	Luminance settings of live image	
DEPTH	Recorded bit length setting	
ZOOM	Zoom live image	
SCROOL	Scroll live image	

3.2 Recording Settings

Record Settings are described below are shown on Table 3-2 and Table 3-3.

3.2.1 Trigger Timing Selection (TRIGGER)

While in VIEW mode, the Trigger Timing Selection can be set in the <VIEW MENU> or by using the TRIG Direct Key on the JPAD 3.

The Trigger Timing Selection sets the number of frames from the beginning of the recording to the Trigger input frame and to the end of the recording.



図 3-4 <VIEW MENU> TRIGGER

■ <VIEW MENU> Setting

- 1) While in VIEW mode, press MENU to display the <VIEW MENU>
- 2) Select "TRIGGER:" using the arrows (Figure 3-4)
- 3) Use the arrows to select the Trigger Timing Selection

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

Custom Trigger Setting

- i) Press the SET after selecting CUSTOM to edit the Custom Trigger setting
- ii) Use the LEFT/RIGHT arrows to move the cursor
Use the UP/DOWN arrows to change the value (-100~+100)
- iii) Press SET again to exit Custom Trigger edit mode

■ TRIG Direct Key

While in view mode use the TRIG Direct Key to select one of the preset trigger settings. The TRIG Direct Key cannot be used to select CUSTOM Trigger settings.

3.2.1.1 Start Trigger

When START Trigger is selected 95% of the available recording time is allocated after the trigger frame. As a default 5% of the available recording time is allocated at before the trigger frame (Figure 3-5).

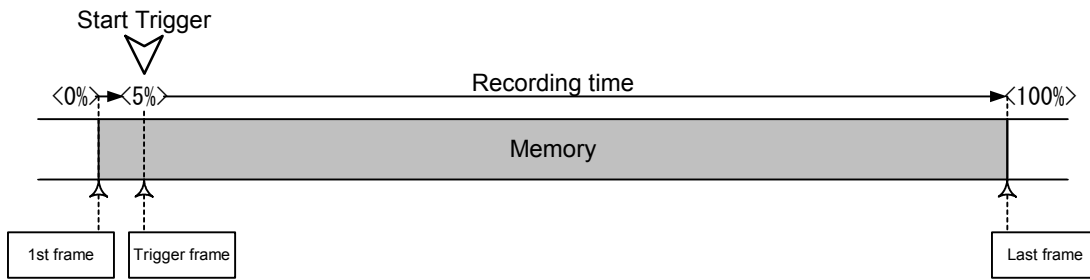


Figure 3-5 Recording with the Start Trigger

3.2.1.2 Center Trigger

When CENTER Trigger is selected the same number of frames (50/50) is allocated before and after the trigger frame (Figure 3-6).

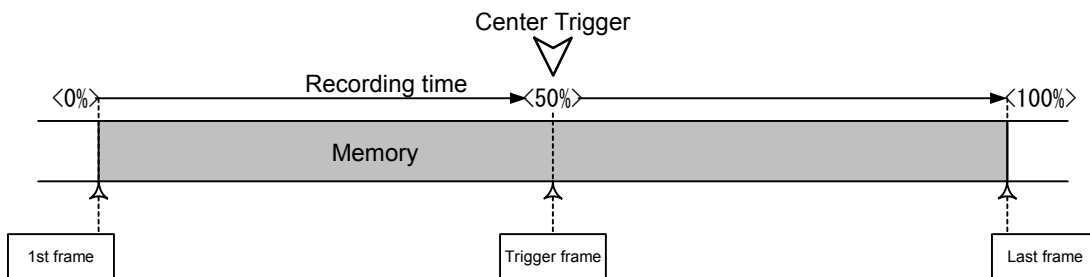


Figure 3-6 Recording with the Center Trigger

3.2.1.3 End Trigger

When END Trigger is selected 95% of the available recording time is allocated before the trigger frame. As a default 5% of the available recording time is allocated after the trigger frame (Figure 3-7).

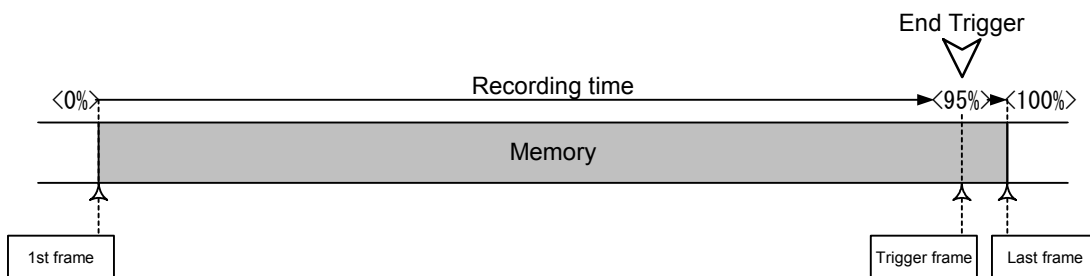


Figure 3-7 Recording with the End Trigger

3.2.1.4 Custom Trigger

In CUSTOM TRIGGER a positive percentage value corresponds to the percentage of available recording time from the beginning of the recording to the trigger frame. The percentage value can be set in 1% intervals. Figure 3-8 shows the Trigger Timing set at +25%.

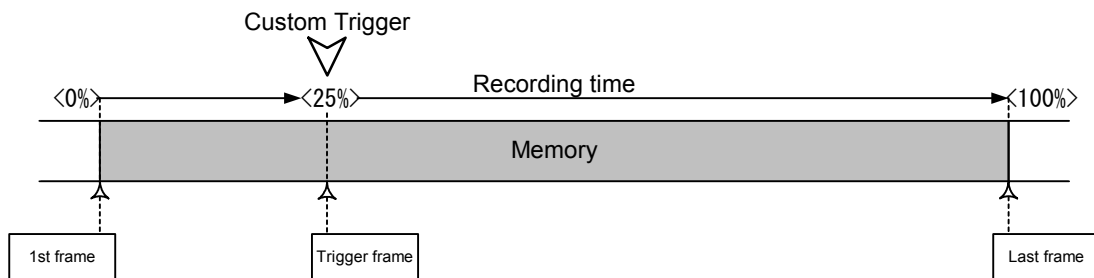


Figure 3-8 Recording with the Custom Trigger (+25%)

In CUSTOM TRIGGER a negative percentage value corresponds to a delay before the recording starts. The percentage value can be set in 1% intervals. Figure 3-9 shows the Trigger Timing set at -100% where the delay corresponds to the same amount of time as the record time. For example if there is 1 second of record time available, the recording will start after 1 second delay has passed.

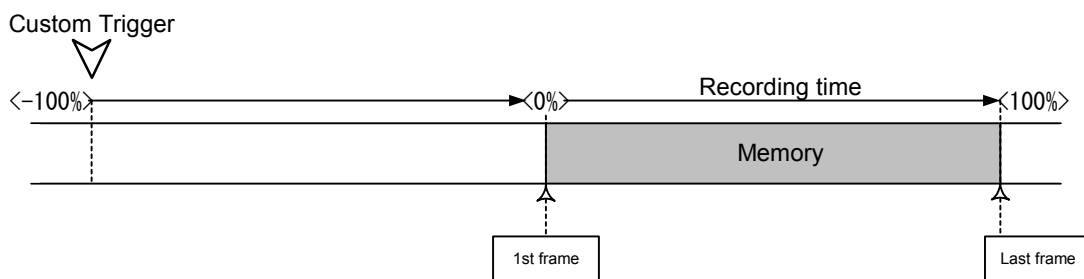


Figure3-9 Recording with the Custom Trigger (-100%)

3.2.2 Recording Speed Selection (FRM RATE)

While in VIEW mode, the Recording Speed Selection can be set in the <VIEW MENU> or by using the TRIG Direct Key on the JPAD 3. When multiple cameras are connected the Recording Speed setting applies to all cameras. Different Recording Speeds cannot be set for each camera independently.

■ <VIEW MENU> Setting

- 1) While in VIEW mode, press MENU  to display the <VIEW MENU>
- 2) Select "FRM RATE:" using the   arrows (Figure 3-10)
- 3) Use the   arrows to select the Recording Speed

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

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	
80000	80,000 pps	
100000	100,000 pps	



図 3-10 FRM RATE



In μ -Cam, ※ is selectable.

Important

■ FRM RATE Direct Key



While in view mode use the FRM RATE Direct Key to select one of the preset recording speeds. The TRIG Direct Key cannot be used to select CUSTOM Trigger settings.

The setting of the recording speed becomes same in several camera heads. Each of several camera heads cannot set different recording speed.



If selecting 250pps or less when using C-Cam, the image quality will deteriorate with the shutter open (grainy image) but if you close the shutter, the image quality will improve.

Important

3.2.3 Frame Size Selection (FRM SIZE)

While in VIEW mode, the Frame Size can be set in the <VIEW MENU> on the J-PAD3. When multiple cameras are connected the Frame Size setting applies to all cameras. Different Frame Sizes cannot be set for each camera independently.

■ <VIEW MENU> Setting

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

The selected Recording Speed limits the Frame Sizes available. Refer to **【7.2.3 Recording Times】** for the frame sizes and recording times that can be set for each recording speed.

<P2-Cam, S2-Cam,C-Cam>

	Horizontal pixels (H)	Vertical pixels (V)
640 x 480	640(H)	480(V) pixel
576 x 432	576(H)	432(V) pixel
512 x 384	512(H)	384(V) pixel
384 x 288	384(H)	288(V) pixel
320 x 240	320(H)	240(V) pixel
256 x 192	256(H)	192(V) pixel
192 x 144	192(H)	144(V) pixel
128 x 96	128(H)	96(V) pixel
64 x 48	64(H)	48(V) pixel
32 x 16	32(H)	16 (V) pixel



Figure 3-11 FRM SIZE

<NOTE>

When with u-Cam, it always displays at 640x480 regardless any number of active pixels

	Horizontal (H)	x	Vertical (V)	
640 x 480	640(H)	x	480(V)	pixel (at 100/250pps)
640 x 480	640(H)	x	456(V)	pixel (at 500pps)
640 x 480	640(H)	x	210(V)	pixel (at 1000pps)

When P2-Cam/S2-Cam/C-Cam are mixed with u-Cam, all these cameras also display at 640x480

<HR-Cam>

	Horizontal pixels (H)	Vertical pixels (V)
1280 x 960	1280(H)	960(V) pixel
1152 x 864	1152(H)	864(V) pixel
1024 x 768	1024(H)	768(V) pixel
896 x 672	896(H)	672(V) pixel
768 x 576	768(H)	576(V) pixel
640 x 480	640(H)	480(V) pixel
512 x 384	512(H)	384(V) pixel
384 x 288	384(H)	288(V) pixel
256 x 192	256(H)	192(V) pixel
128 x 96	128(H)	96(V) pixel
64 x 32	64(H)	32 (V) pixel

The setting of the Frame Size becomes same in several camera heads. Each of several camera heads cannot set different Frame Size.

Also, if using a combination of HR-Cam and P2-Cam or S2-Cam or C-Cam, the number of horizontal and vertical pixels for the HR-Cam frame size and the P2-Cam or S2-Cam or C-Cam frame size will both double. Including μ -Cam when is mixed, in HR-Cam, 1280 x 960 is fixed.

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

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











The custom setting is not possible at the time of the C-Cam, μ -Cam mixture (work in a range to pre-set of C-Cam, μ -Cam).

Important

- **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**
<P2-Cam, S2-Cam>
Horizontal pixels can be set in 32 pixel intervals while vertical pixels can be set in 16 pixel intervals.
<HR-Cam>
Horizontal pixels can be set in 64 pixel intervals while vertical pixels can be set in 32 pixel intervals.

With recording speed priority, the upper limit of the frame size is determined by the recording speed

■ <VIEW MENU> Setting

- 1) While in VIEW mode, press MENU  to display the <VIEW MENU>
- 2) Select "CUSTOM F:" using the   arrows and press SET  to display the CUSTOM F sub-menu (Figure 3-12)
- 3) Select "PRIORITY:" using the   arrows and then use the   arrows to select either the Recording Speed or Frame Size as priority (Figure 3-13)

RATE = Recording speed priority
SIZE = Frame size priority









Figure 3-12 CUSTOM F



Figure 3-13 PRIORITY

■ <FRM RATE> Setting

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








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



Figure 3-14 FRM RATE

■ <FRM SIZE> Setting

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

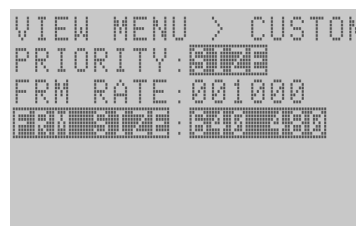






Figure 3-15 FRM SIZE

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.



3.2.5 Shutter Exposure Time Selection (SHUTTER)

While in VIEW mode, the Shutter Exposure Time can be selected from the <VIEW MENU> on the J-PAD3. The shutter exposure time can be selected from either preset or custom values.


■ <VIEW MENU> Setting

- 1) While in VIEW mode, press MENU  to display the <VIEW MENU>
- 2) Select "SHUTTER:" using the   arrows (Figure 3-16).

■ Preset Shutter Exposure Time









- 3) Use the   arrows to select the desired preset shutter exposure time.

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

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.

■ Custom Shutter Exposure Time

The Custom Shutter Exposure Time can be set in the last preset value to the left which shows 6 numerical columns in microseconds (*****us)

- i) Use the   arrows to select (*****us) and press SET .
- ii) Use the   arrows to move the cursor and use the   arrows to change the numerical value (Figure 3-17)
- iii) To set the Custom Shutter Exposure Time press SET .

The available settings for the custom shutter exposure time change according to the recording speed and frame size.

■ SHUTTER Direct Key



While in STOP or VIEW modes use the SHUTTER Direct Key to select one of the preset recording speeds. The SHUTTER Direct Key cannot be used to select CUSTOM Trigger settings.



Important

When multiple MEMRECAM DRPs are connected ensure that all have a compatible Exposure Timing setting. The MEMRECAM GX series use START Exposure Timing. In contrast, the MEMRECAM fx series use END Exposure Timing.

Please refer to **【7.1.4 Compatibility with the Previous Series】** for additional details on synchronizing mixed multi camera configurations.

Additional details for setting the Exposure Timing Selection (EXP TIME) can be found at **【3.2.18 Exposure Timing Selection (EXP TIME)】**



Figure 3-16 SHUTTER



Figure 3-17 SHUTTER (Custom)






Even if the shutter exposure time settings are displayed on the menu, it may not be possible to set due to the recording conditions or the combination of varying types of cameras (P2-Cam、S2-Cam、HR-Cam、C-Cam、 μ -Cam) . In this case, the settings for the shutter exposure times will revert to that before the changes were made.

3.2.6 Recording Bit Length Settings (DEPTH)

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

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

■ <VIEW MENU> Setting

- 1) While in VIEW mode, press MENU  to display the <VIEW MENU>
- 2) Select "DEPTH:" using the   arrows (Figure 3-18)
- 3) Use the   arrows to select the recording bit length

8	8 bit	
10	10 bit	(standard image setting)

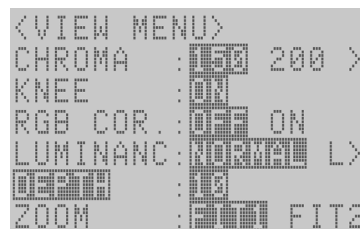


Figure 3-18 DEPTH



Important

Only 8 & 10 bits can be selected in the MEMRECAM GX-5. Although the J-PAD3 shows 12 bits is shown it cannot be selected.

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

While in VIEW mode, the initial value for the Recorded Scene Number (SCENE) can be set in the <VIEW MENU> on the J-PAD3.

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

■ <VIEW MENU> Setting










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



Figure 3-19 SCENE

3.2.8 Memory Segment Settings (SEG SIZE)

While in STOP mode, the number Memory Segments can be defined from the SYS MENU on the J-PAD3.

The memory can be segmented into a maximum of 64 segments. The record time for the memory segments shortens as to the number of segments increase. Separate scenes can be recorded in each of the 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.



Important

Images recorded in the memory are erased when the memory segments are changed. Change the Memory Segment configuration only after confirming if it is an image that can be erased.

Save the image in memory to an USB storage media or to a PC using HXLink before continuing.

Please refer to 【2.10 Saving】 or 【HXLink manual】 for the saving method of an image.

■ <VIEW MENU> Setting












- 1) While in STOP mode, press MENU  to display the <TOP MENU>
- 2) Select "SYS MENU:" using the   arrows and press SET  to display the SYS MENU sub-menu
- 3) Select "SYS SET" using the   arrows and press SET  to display the SYS SET sub-menu (Figure 3-20)
- 4) Select "SEG SIZE" using the   arrows and select the number of memory segments using the   arrows



図 3-20 SYS SET

The relationship between the segment size and number of segments with a single P2-Cam or S2-Cam or C-Cam or μ -Cam connection is shown below. Refer to 【7.2 Recorder】 for details.

<MEMORY 8GB>

8.5GBX1	No memory segmentation
4.2GBX2	Segment into two 4.2GB segments
2.1GBX4	Segment into four 2.1GB segments
1.0GBX8	Segment into eight 1.0GB segments
533MBX16	Segment into sixteen 533MB segments
266MBX32	Segment into thirty two 266MB segments
133MBX64	Segment into sixty four 133MB segments

<MEMORY 4GB>

4.2GBX1	No memory segmentation
2.1GBX2	Segment into two 2.1GB segments
1.0GBX4	Segment into four 1.0GB segments
533MBX8	Segment into eight 533MB segments
266MBX16	Segment into sixteen 266MB segments
133MBX32	Segment into thirty two 133MB segments

< MEMORY 2GB>

2.0GBX1	No memory segmentation
1.0GBX2	Segment into two 1.0GB segments
524MBX4	Segment into four 524MB segments
262MBX8	Segment into eight 262MB segments
131MBX16	Segment into sixteen 131MB segments
65MBX32	Segment into thirty two 65MB segments

The relationship between the segment size and number of segments with a single HR-Cam connection is shown below. Refer to **[7.2 Recorder]** for details.

<MEMORY 8GB>

8.5GBX1	No memory segmentation
4.2GBX2	Segment into two 4.2GB segments
2.1GBX4	Segment into four 2.1GB segments
1.0GBX8	Segment into eight 1.0GB segments
533MBX16	Segment into sixteen 533MB segments
266MBX32	Segment into thirty two 266MB segments

<MEMORY 4GB>

4.2GBX1	No memory segmentation
2.1GBX2	Segment into two 2.1GB segments
1.0GBX4	Segment into four 1.0GB segments
533MBX8	Segment into eight 533MB segments
266MBX16	Segment into sixteen 266MB segments

< MEMORY 2GB>

2.0GBX1	No memory segmentation
1.0GBX2	Segment into two 1.0GB segments
524MBX4	Segment into four 524MB segments
262MBX8	Segment into eight 262MB segments

- 5) Once the number of memory segments is selected, a verification message verifying the memory segmentation will be displayed (Figure 3-21).



Important


If there are no problems erasing the images saved in the memory press SET  to segment the memory.



Figure 3-21 Verification message

3.2.9 External Trigger Signal Selection (TRIG SEL)

While in STOP mode, the external trigger signals can be selected from the <SYS MENU> on the J-PAD3. The GX5 can be triggered manually using the J-PAD3 remote control or from signal inputs on the J1 Cable TRIG1 branch and the J3 Cable TRIG2 branch.

■ <VIEW MENU> Setting










- 1) While in STOP mode, press MENU  to display the <TOP MENU>
- 2) Select "SYS MENU:" using the   arrows and press SET  to display the SYS MENU sub-menu
- 3) Select "TRIG SET" using the   arrows and press SET  to display the TRIG SET sub-menu (Figure 3-22) .
- 4) Select "TRIG SEL" and use the arrows   to select the external trigger signal input connector.



Figure 3-22 TRIG SEL

TRIG1 Trigger signal from TRIG1 connector (TTL Falling)
TRIG2 Trigger signal from TRIG2 connector (Rising)



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

The polarity of the external trigger signals from the TRIG1 and TRIG2 connectors can be set. Refer to **【3.2.14 External Input/Output Signal Polarity Selection (SIG SET)】** .

3.2.9.1 External Trigger Signals from TRIG1

The TRIG1 connector can accept TTL or contact closure External trigger signals. Refer to **【7 Specifications】** for details.

The advantage for using trigger signals from TRIG1 is its ease of use. The camera is triggered when using the contact closure input when there is a connection between the two wires or switch. It is recommended that this trigger method be used in a clean environment where there is no external noise. The voltage tolerance range is quite narrow (-0.5~5.5Vdc) .

3.2.9.2 External Trigger Signals from TRIG2

The TRIG2 connector can accept voltage pulse External trigger signals via the current loop input from the photo coupler. Refer to **【7 Specifications】** for details.

The advantage for using trigger signals from TRIG2 is the excellent resistance to noise and is well suited for applications with long distance cables. This is the recommended method to use where there might be environment noise, such as where static is often generated. However, an external power source is needed to use this input.

3.2.9.3 Setting of filter value

A Noise Filter value can be set when noise is present in the external trigger signal. Please refer to **【3.2.15 Tigger filter setting 】** for additional details.

3.2.10 Recording Method Selection (REC MODE)

While in STOP mode, the Recording Method can be selected from the <SYS MENU> on the J-PAD3.

There are four recording methods available:

- **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)]



Important

Depending on the recording method, there may be cases when the trigger input from the J-PAD3 does not function. Trigger input from external trigger signals work on all recording methods (Table 3-4).

Table 3-4 Valid Trigger Input by Recording Method

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

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

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

3.2.10.1 AUTO Mode

The AUTO mode automatically switches between memory segments when recording (REC mode) ends returning to ARM mode on the next segment. This allows for continuous recording for each memory segment. The DRP returns to STOP mode once recording of all of memory segments has been completed. The image in memory is protected once the recording has been completed thus overwriting is prohibited in AUTO mode. When attempting to switch to ARM mode, a warning message will be displayed (Figure 3-23).

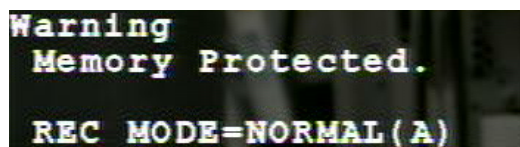








Figure 3-23 Memory Protected

Press STOP  to stop recording even if recording to all of the memory segments 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.10.2 LOOP Mode

While in LOOP mode the memory segments are automatically switched when recording (REC mode). Once the recording ends for the particular memory segment the camera returns to ARM mode on the next segment. It is different from AUTO mode since there is no memory protection upon the completion of recording. Images are overwritten allowing for repeated recording can be performed.

Recording is repeated until STOP  is pressed.



Important

It takes about 4.5 seconds each time there is a switch between memory segments. Ensure that the trigger input is received while in ARM mode since triggers signals may be ignored during this time.

3.2.10.3 Setting Record Modes












- 1) While in STOP mode, press MENU  to display the TOP MENU.
- 2) Select "TRIG SET" from TOP MENU using the arrows  and press SET  to display the TRIG SET sub-menu (Figure 3-24).
- 3) Select "REC MODE" and use the arrows   to select the recording method.



Figure 3-24 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.

3.2.10.4 Normal Recording

Normal recording 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 **【3.2.10.3 Setting Record Modes】** for the method of setting normal recording.

3.2.10.4.1 NORMAL

Figure 3-25 shows how to set for NORMAL recording (top of the figure) with the J-PAD3 during and saving in the memory (bottom of the figure).

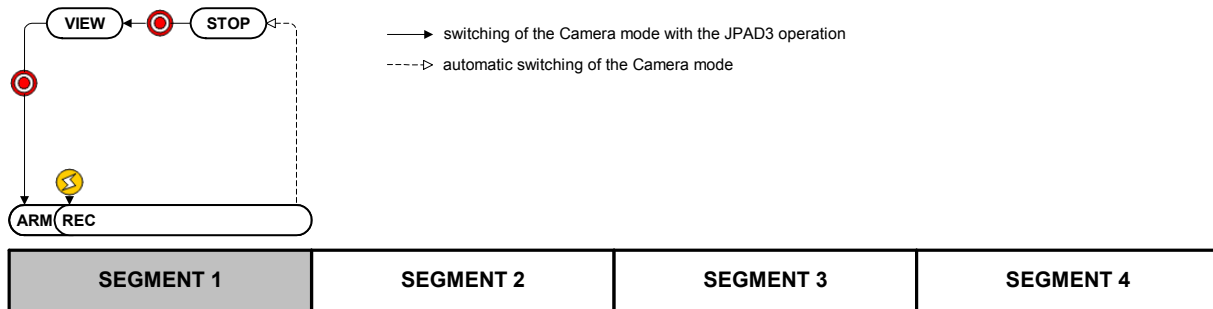










Figure 3-25 Normal Recording (NORMAL, number of segments : 4)

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

- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
 - 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to VIEW mode.
 - 3) While in VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
 - 4) While in ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to 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 REC mode to 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.10.4.2 NORMAL (A)

Figure 3-26 shows how to set for NORMAL (A) recording (top of the figure) with the J-PAD3 during and saving in the memory (bottom of the figure). NORMAL (A) refers to normal recording in AUTO mode.

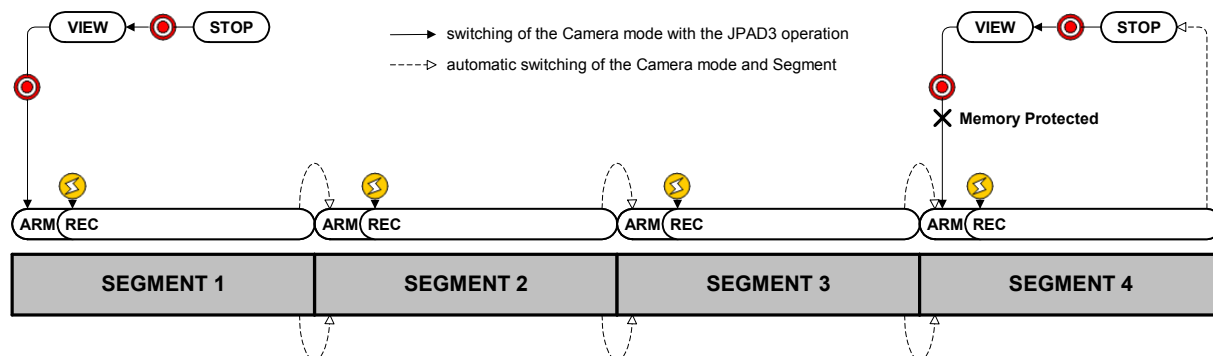











Figure 3-26 Normal Recording (NORMAL (A), Number of Segments : 4)

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.

- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
 - 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to VIEW mode. The memory segment number (SEG) superimposed on the image is displayed as "A". Settings in AUTO mode are displayed. 
 - 3) While in VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
 - 4) While in ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to 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 REC mode to ARM mode.
 - 6) Recording in 4)~5) is repeated, and once recording to all of the memory segments has been completed, it switches from REC mode to 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 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.10.4.3 NORMAL (L)

Figure 3-27 shows how to set for NORMAL (L) recording (top of the figure) with the J-PAD3 during and saving in the memory (bottom of the figure).

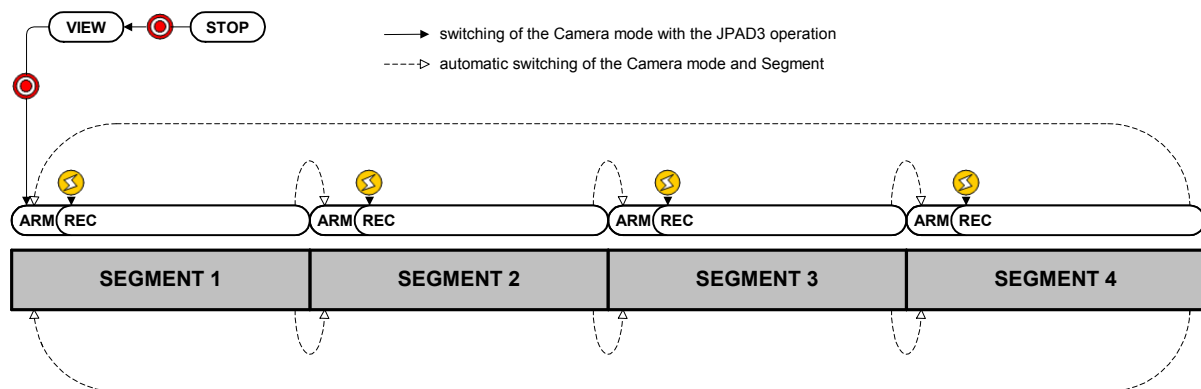












Figure 3-27 Normal Recording (NORMAL(L), Number of Segments : 4)

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

- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
- 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to VIEW mode. The memory segment number (SEG) superimposed on the image is displayed as "L". Settings in LOOP mode are displayed. 
- 3) While in VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
- 4) While in ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to 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 REC mode to 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 REC mode to 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.10.5 Burst Recording

While in Burst Recording mode, images are recorded as long as there is a burst trigger signal present. Burst trigger signals allow for only the desired frames within the time frame the signal is present to be saved to memory as shown in (Figure 3-28).

Also, the memory is automatically segmented into blocks according to the number of frames taken by each burst recording. Recording stops when the total of all the frames saved reached the maximum capacity of the memory. Figure 3-28 shows the number of frames for each recording time saved with three burst trigger signal inputs.

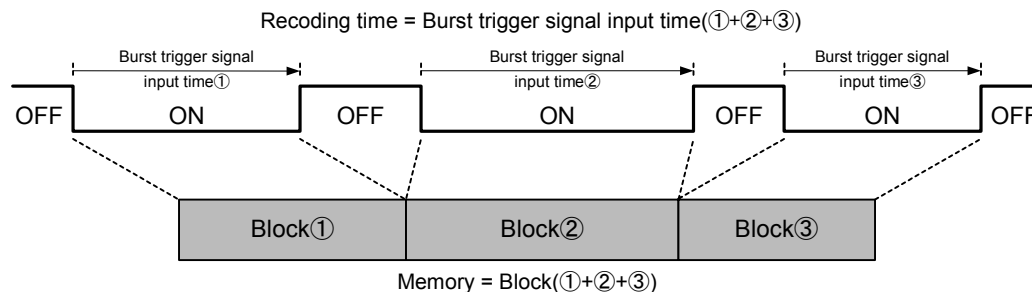


Figure 3-28 Burst Recording

The three modes within burst recording include BURST, BURST (A) and BURST (L). Refer to **【3.2.10.3 Recording Method Selection (REC MODE)】** for the method of setting burst recording. Next are the restrictions on burst recording and the recording sequence for each mode.

3.2.10.5.1 Burst Recording Restrictions

The following restrictions apply to burst recording.

- Burst recording cannot be combined with multi trigger recording and event recording. Recording can be combined with EST synchronized signal recording.
- Trigger input does not work with the J-PAD3 during burst recording. Input burst recording signals from the 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.
Please refer to the **【3.2.16 Time stamp recording settings】** for the time stamp settings and to **【5 System settings】** for the frame time standard settings.
- If conducting burst recording with a C-Cam/ μ -Cam, there will be a single frame lag. Recording starts from the image one frame before the trigger (start recording) and recording ends at one frame before the trigger (end recording).

3.2.10.5.2 BURST

Figure 3-29 shows how to set for BURST recording (top of the figure) with the J-PAD3 during 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.

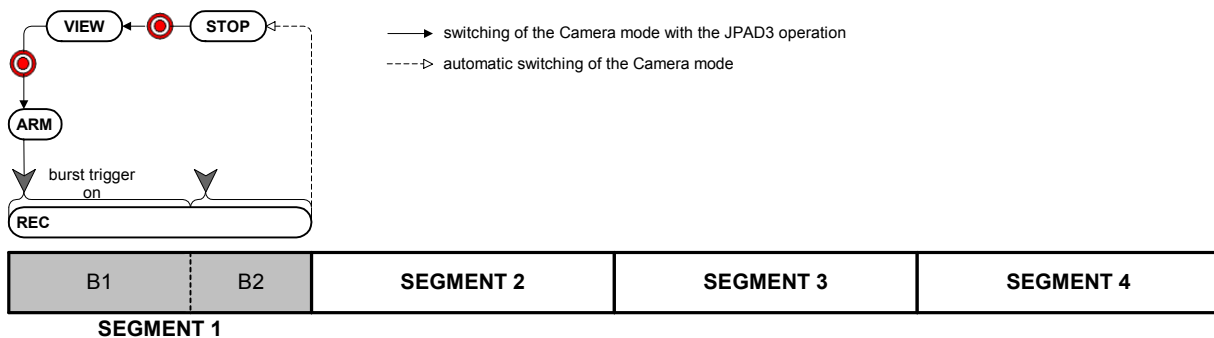









Figure 3-29 Burst Recording (BURST, number of segments : 4)

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

- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
 - 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to 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 VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode.
During burst recording, images cannot be overwritten, even in ARM mode. Also, live images cannot be updated.
 - 4) While in ARM mode, input the burst trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to switch to 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 STOP mode from 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 ARM mode
As much as one frame is not recorded in case of burst recording.
 - If STOP  is pressed during REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.10.5.3 BURST (A)

Figure 3-30 shows how to set for BURST (A) recording (top of the figure) with the J-PAD3 during 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.

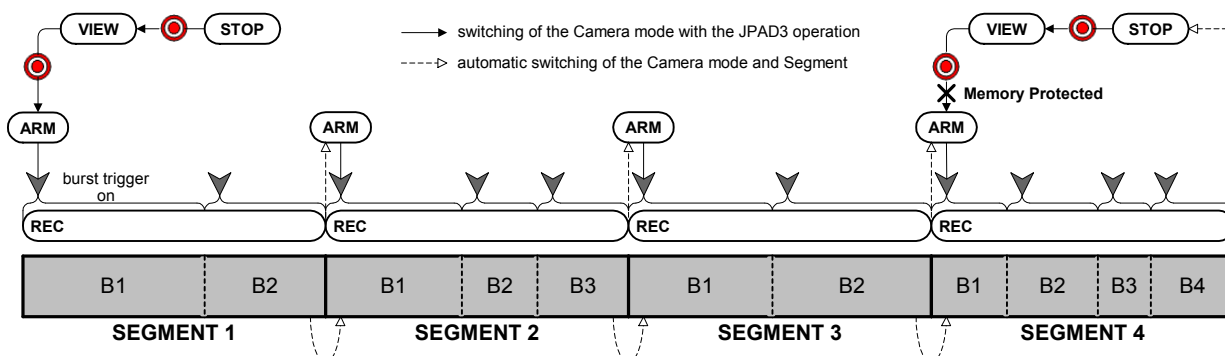


Figure 3-30 Burst Recording (BURST(A), Number of Segments : 4)

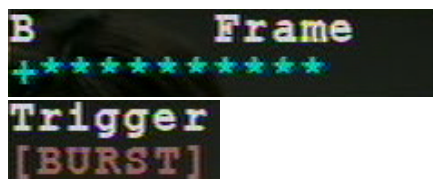
The sequence for segmenting the memory into four memory segments and performing BURST (A) recording for all of the memory segments is shown below. The memory should be empty before recording is started.

- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
- 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to 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 VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode.
During burst recording, images cannot be overwritten, even in ARM mode. Also, live images cannot be updated.
- 4) While in ARM mode, input the burst trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to switch to 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 REC mode to ARM mode.
- 6) Recording in 4)~5) is repeated, and once recording to all of the memory segments has been completed, it switches from REC mode to 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 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 ARM mode
As much as one frame is not recorded in case of burst recording.
 - If STOP  is pressed during REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.10.5.4 BURST (L)

Figure 3-31 shows how to set for BURST (L) recording (top of the figure) with the J-PAD3 during 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.

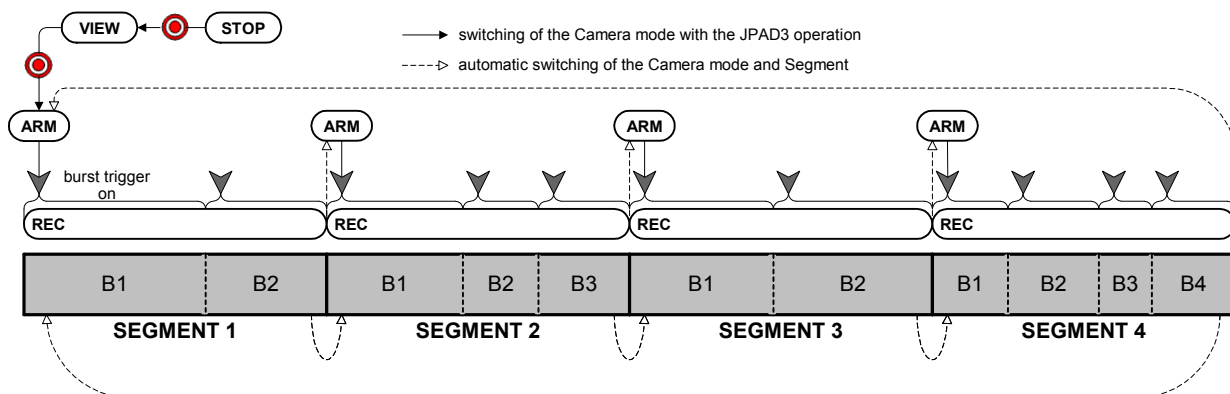
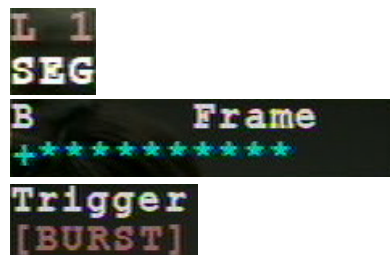


Figure3-31 Burst Recording (BURST (L), Number of Segments : 4)

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


- 1) Verify that the MEMRECAM GX-1 is in STOP mode.
- 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to 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 VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode. During burst recording, images cannot be overwritten, even in ARM mode. Also, live images cannot be updated.
- 4) While in ARM mode, input the burst trigger signals from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector to switch to 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 REC mode to 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 REC mode to 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 ARM mode
As much as one frame is not recorded in case of burst recording.
 - If STOP  is pressed during REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.10.6 Multi Trigger Recording

When using multi trigger recording, the memory can be segmented into a maximum of 16 uniform blocks. Each block is then triggered and multiple images can be recorded separately. When the recording (REC Mode) for the block is completed it automatically switches between blocks returning to ARM mode ready to record the next block (ALL BLOCKS Mode).

The four modes within multi trigger recording include MULTI (A), MULTI (C), MULTIS (A), and MULTIS (L). Refer to **【3.2.10.3 Setting Record Modes】** 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.

3.2.10.6.1 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. Ensure that the trigger input is received while in ARM mode since triggers signals may be ignored during this time.

3.2.10.6.2 MULTI (A)

The (A) in MULTI (A) indicates that it is set to “ALL BLOCKS” mode. In the ALL BLOCKS mode, once recording to all of the blocks in the appropriate segment has been completed, it returns to 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 3-32 shows how to switch modes with the J-PAD3 during MULTI(A) recording (top of the figure) and saving in the memory (bottom of the figure).

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

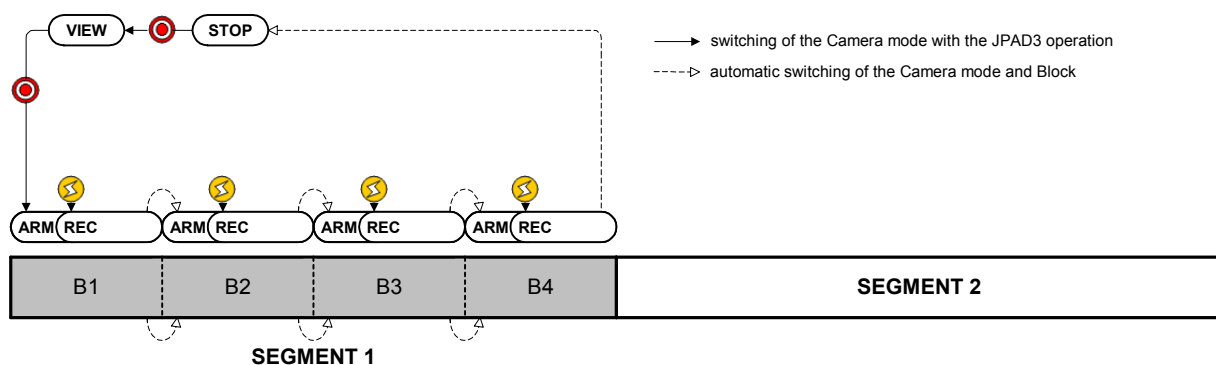












Figure 3-32 Multi Trigger Recording (MULTI (A), Number of Segments: 2, Number of Blocks: 4)

- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
 - 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to 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 VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode.
The frame counter (Frame) displays "01 A". While the images are overwritten to block 1, it awaits trigger input. 
 - 4) While in ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to 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 REC mode to 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 REC mode to 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed

3.2.10.6.3 MULTI(C)

MULTI (C) indicates “CONTINUOUS” mode. In CONTINUOUS mode, multi trigger recording can be repeated while overwriting blocks in the appropriate segment after the recording has been completed. Figure 3-33 shows how to switch modes with the J-PAD3 during MULTI (C) recording (top of the figure) and saving in the memory (bottom of the figure).

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

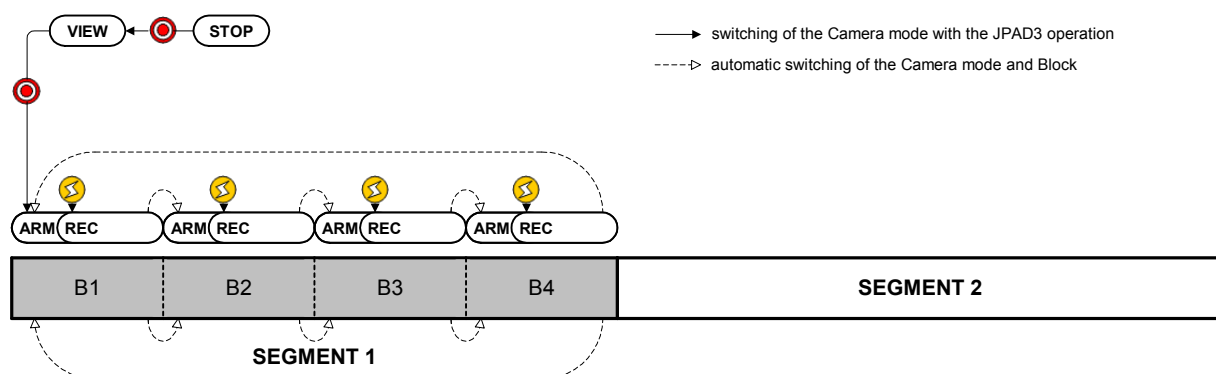



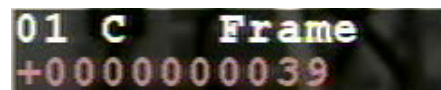
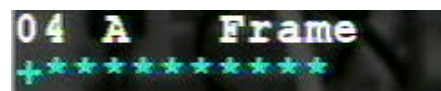








Figure 3-33 Multi Trigger Recording (MULTI(C), Number of Segments: 2, Number of Blocks: 4)

- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
- 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to 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 VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode.
The frame counter (Frame) displays "01 C". While the images are overwritten to block 1, it awaits trigger input.
- 4) While in ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to 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 REC mode to 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 REC mode to 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.10.6.4 MULTIS(A)

Figure 3-34 shows how to switch modes with the J-PAD3 during MULTIS (A) recording (top of the figure) and saving in the memory (bottom of the figure). MULTIS (A) is multi trigger recording in 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.

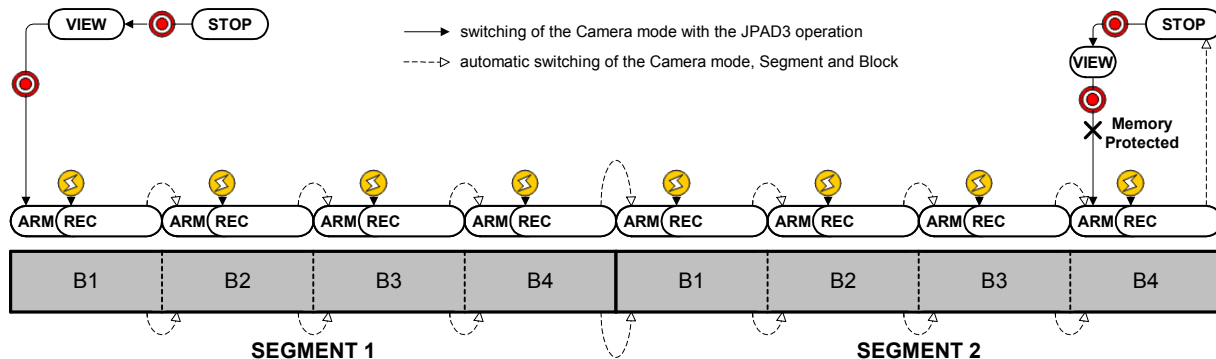


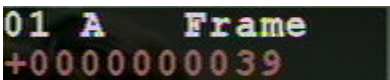


Figure3-34 Multi Trigger Recording (MULTIS (A), Number of Segments: 2, Number of Blocks: 4)

- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
 - 2) While in STOP mode, press VIEW/ARM on the J-PAD3 to switch to 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 VIEW mode, press VIEW/ARM on the J-PAD3 to switch to ARM mode.
The frame counter (Frame) displays "01 A". While the images are overwritten to block 1, it awaits trigger input.

 - 4) While in ARM mode, press TRIG on the J-PAD3 or use the external trigger for input to switch to 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 REC mode to 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 REC mode to 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 REC mode to 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 ARM mode. If you want to record again, either change the settings to a recording method other than 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP was pressed

3.2.10.6.5 MULTIS (L)

Figure 3-35 shows how to switch modes with the J-PAD3 during MULTIS (L) recording (top of the figure) and saving in the memory (bottom of the figure). MULTIS (L) is multi trigger recording in the LOOP mode. The sequences for setting two memory segments and four blocks, and for MULTIS (L) recording to all of the memory segments are shown below.

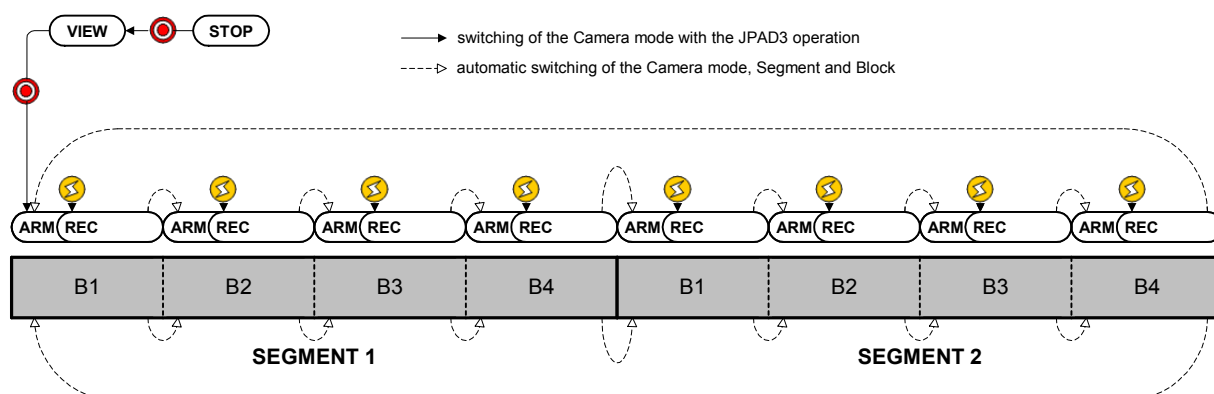
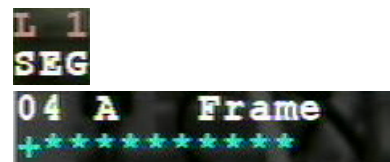


Figure3-35 Multi Trigger Recording (MULTIS (L), Number of Segments: 2, Number of Blocks: 4)

- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
- 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to VIEW mode.

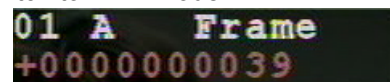
The memory segment number (SEG) superimposed on the image shows "L". The LOOP mode settings are displayed.





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



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




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



- 4) While in ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to 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 REC mode to 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 REC mode to 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 REC mode to 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed

3.2.10.7 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 marked onto the image the instant the event trigger occurs.

The three modes within event recording include EVENT, EVENT (A) and EVENT (L). Refer to **【3.2.10.3 Setting Record Modes】** for the method of setting event recording.

3.2.10.7.1 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 originate from the J-PAD3 but continuous event trigger input are not possible with the J-PAD3. The subsequent event trigger signals should originate from the J1 cable TRIG1 connector or the J3 cable TRIG2 connector.
- The event is not recorded for custom trigger 100%~-1%.

3.2.10.7.2 EVENT

Figure 3-36 shows how to switch modes with the J-PAD3 during event recording (top of the figure) and saving in the memory (bottom of the figure).

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

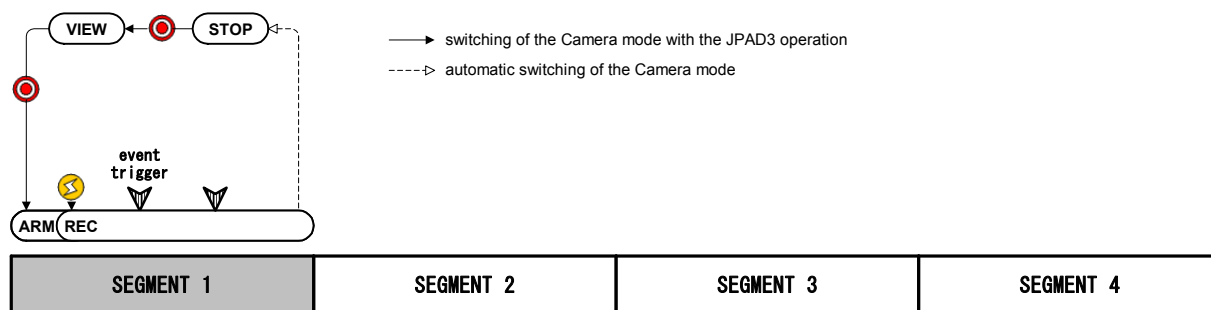











Figure 3-36 Event Recording (EVENT, number of segments : 4)

- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
 - 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to VIEW mode.
The frame counter (FRAME) superimposed on the image is displayed as "E". Event recording settings are displayed.
- 
- 3) While in VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
 - 4) While in ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to 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 REC mode to 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed

3.2.10.7.3 EVENT (A)

Figure 3-37 shows how to switch modes with the J-PAD3 during EVENT (A) recording (top of the figure) and saving in the memory (bottom of the figure). EVENT (A) refers to event recording in the AUTO mode. The sequences for setting four memory segments and for EVENT (A) recording to all of the memory segments are shown below. The memory should be empty before recording is started.

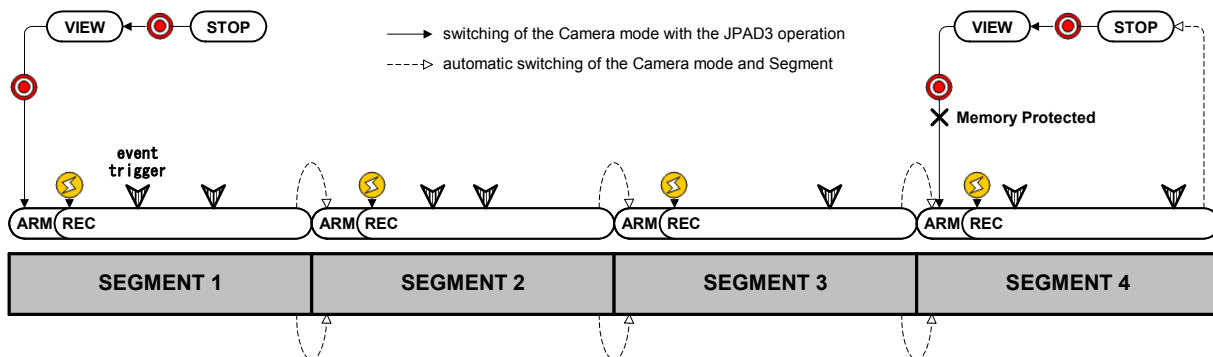

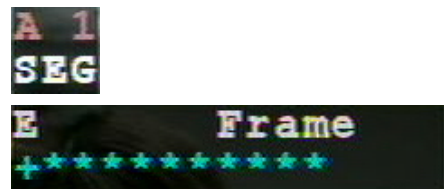






Figure 3-37 Event Recording (EVENT(A), Number of Segments: 4)




- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
- 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to 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 VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
- 4) While in ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to 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 REC mode to ARM mode.
- 6) Repeat recording in 4)~5), and once recording to all of the memory segments has been completed, it switches from REC mode to 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 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.

3.2.10.7.4 EVENT (L)

Figure 3-38 shows how to switch modes with the J-PAD3 during EVENT (L) recording (top of the figure) and saving in the memory (bottom of the figure). EVENT (L) is event recording in the LOOP mode. The sequences for setting four memory segments and for EVENT (L) recording to all of the memory segments are shown below.

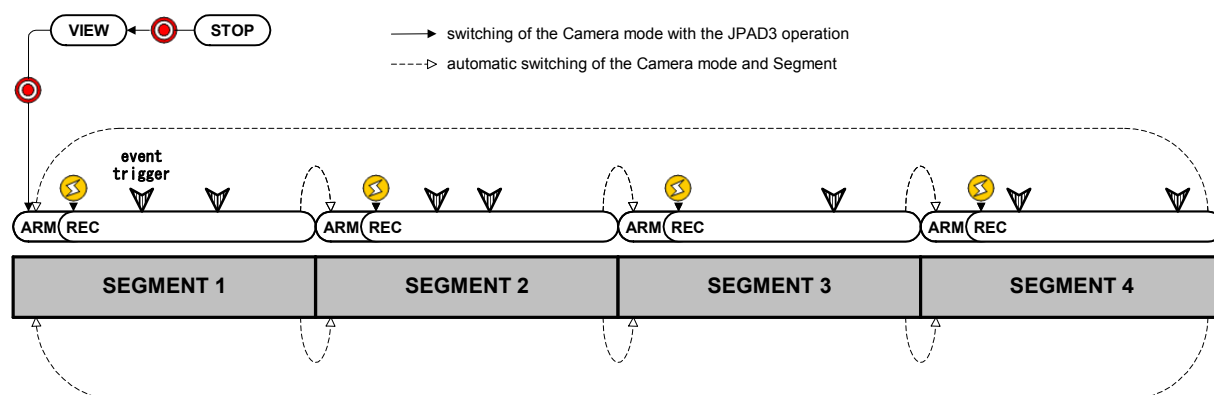


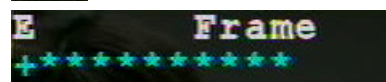
Figure 3-38 Event Recording (EVENT(L), Number of Segments: 4)



- 1) Verify that the MEMRECAM GX-5 is in STOP mode.
- 2) While in STOP mode, press VIEW/ARM  on the J-PAD3 to switch to 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 VIEW mode, press VIEW/ARM  on the J-PAD3 to switch to ARM mode. While the images are overwritten to the appropriate memory segment (SEGMENT1), it awaits trigger input.
- 4) While in ARM mode, press TRIG  on the J-PAD3 or use the external trigger for input to switch to 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 REC mode to 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 REC mode to 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 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 REC mode
Recording stops after saving from the frame where recording was started to the frame at the instant STOP  was pressed.



3.2.11 Synchronized Timing Selection (SYNC TIME)

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

The MEMRECAM GX-5 can be synchronized to an external timing device.

- Camera Synchronized Time
Camera is synchronized with its internal timer. Select this option if the GX-5 is used stand alone or if there is no need for precise synchronization. If a control PC is connected, synchronization is possible with the PC.
- 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-5 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-5 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

3.2.11.1 Setting Method

- 1) Select SYS MENU from the TOP MENU.
- 2) Select "SYNC TIME" from the SYS MENU (Figure 3-39).
- 3) Use the arrows   to select the synchronized time.

ASYNCR	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




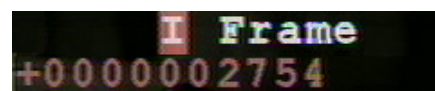
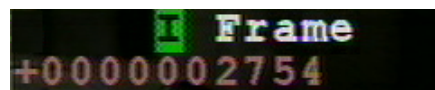
Figure 3-39 SYNC TIME

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

3.2.11.2 IRIG Synchronized Time

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

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



3.2.12 Synchronized Signal Selection (SYNC SEL)

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

The MEMRECAM GX-5 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.

3.2.12.1 Setting Method









- 1) While in 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 3-40).
- 4) Use the arrows   to select the synchronized signals.



Figure 3-40 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 **【3.2.14 External Input/Output Signal Polarity Selection (SIG SET)】** .

3.2.12.2 Synchronized EST Signal Recording

3.2.12.2.1 Precautions for Use

- 1) Filter Value Settings
If there is noise in the EST signal, set a noise filter value to activate the filter.
Refer to the **【3.2.16 EST Filter Settings(EST FLT)】** for the setting method.
- 2) Timing Restrictions
The relationship between the cycle for the EST signal and the maximum recording speed must fulfill the following conditions. If they are not met, proper recording is not possible.

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

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

$$\text{EST signal cycle} > \text{shutter exposure time} + 0.9 \mu \text{ sec}$$

3.2.12.2.2 Precaution for C-Cam, μ -Cam Use

- The frame rate must be set to at least three times that of the peak frequency (reciprocal of the shortest cycle) of the external exposure start signal.
- If the above condition is not met, the image will be over- or under-exposed.
- It is possible to use multiple C-Cams or μ -Cams but it is not possible to combine them with other types of cameras, such as the P2-Cam and such.

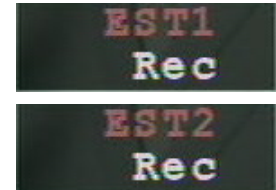
3.2.12.3 Display During Recording

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



2) ARM Mode

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

3) REC Mode

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

3.2.13 Sync Signal Settings in VIEW (EST VIEW)

If performing EST signal synchronization recording, when in VIEW, make a selection to display images captured and synchronized with EST signals or to display images captured at the synchronization signals within the camera.

EST VIEW OFF : Internal sync when in VIEW

When in VIEW, displays images at internal sync signals, and EST signal sync recording performed only when in ARM.

EST VIEW ON : EST signal sync when in VIEW

Displays images synchronized with the EST signals in the same manner as when in VIEW or ARM.









- 1) When in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the up/down arrows   to select SYS MENU from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the up/down arrows   to select EST VIEW from the SYS MENU (Figure 3-41) .
- 4) Use the left/right arrows   to select the sync signal settings when in VIEW.



Figure 3-41 EST VIEW

OFF	Internal sync when in VIEW
ON	EST signal sync when in VIEW

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

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

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 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 (Figure3-42).
- 4) Select the external input/output signal to be set and use the arrows   to select the polarity.



Figure 3-42 SIG SET

TRIG1	POSI	Detect external trigger signals from the J1 cable at the H level (insulation)
	NEGA	Detect external trigger signals from the J1 cable at the L level (short circuit)
TRIG2	CRNTON	Detect external trigger signals from the J3 cable at the H level
	CRNTOFF	Detect external trigger signals from the J3 cable at the L level
EST1	POSI	Detect the EST signals from the J1 cable at the rising edge
	NEGA	Detect the EST signals from the J1 cable at the falling edge
EST2	POSI	Detect the EST signals from the J3 cable at the rising edge
	NEGA	Detect the EST signals from the J3 cable at the falling edge
EPO	POSI	Output the H level signals during exposure
	NEGA	Output the L level signals during exposure
ARM CMD	POSI	Detect the ARM command signals at the rising edge
	NEGA	Detect the ARM command signals at the falling edge
ARM STS	POSI	Insulation during ARM mode (open collector output)
	NEGA	Short circuit during ARM mode (open collector output)
FAULT	POSI	Insulation during FAULT status (open collector output)
	NEGA	Short circuit during FAULT status (open collector output)

3.2.15 Trigger Filter Settings (TRIGFLT)

While in STOP mode, the effect of the filter for the external trigger signal can be selected from the SYS MENU on the J-PAD3.

The noise filter circuit of the digital method is built into MEMRECAM GX-5. The effect of the filter can be enlarged by significantly increasing the filter value when there are a lot of external noises.

The filter value shows delay time when a beautiful square pulse without chattering is input. It is possible to set it between 0.0~6553.5 μ sec in 0.1 μ sec.

This filter value is applied to two external trigger input (TRIG1, TRIG2) together.

However, when the polarity is set to NEGA, about 1.4 μ sec are always added to the delay time of TRIG1 (J1 cable) with an analog filter in the input part as for the delay. The added delay increases at about 30 μ sec when the polarity is set to POSI.

When the polarity is made CRNTON, about 150 μ sec are added to the delay time of TRIG2 (J3 cable) about 5 μ sec when making it to CRNTOFF.














- 1) While in 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.
- 4) 「TRIGFLT」 is selected, and press SET  (Figure 3-43) .
- 5) Use the arrows   to move columns and use arrows   to change the numerical value. (Range: 0.0~6553.5 μ sec)
- 6) Press SET  again, and the filter value is set.



Figure 3-43 TRIGFLT

3.2.16 EST Filter Settings(EST FLT)

While in STOP mode, the effect of the filter for the EST signal can be selected from the SYS MENU on the J-PAD3.

The noise filter circuit of the digital method is built into MEMRECAM GX-5. The effect of the filter can be enlarged by greatly setting the filter value when there are a lot of external noises.

The filter value shows delay time when a beautiful square pulse without chattering is input. It is possible to set it between 0.0~6553.5 μ sec in 0.1 μ sec.

This filter value is applied to two EST input (EST1,EST2) together.

However, when the polarity is set to NEGA, about 1.4 μ sec are always added to the delay time of EST1 (J1 cable) and EST2 (J3 cable) with an analog filter in the input part as for the delay. The added delay increases at about 30 μ sec when the polarity is set to POSI.














- 1) While in 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.
- 4) 「EST FLT」 is selected, and press SET  (Figure 3-44) .
- 5) Use the arrows   to move columns and use arrows   to change the numerical value. (Range : 0.0~6553.5 μ sec)
- 6) Press SET  again, and the filter value is set.











Figure 3-44 EST FLT

3.2.17 Time Stamp Recording Settings (TIMESTAMP)

While in STOP mode, Time Stamp Recording can be selected from the SYS MENU on the J-PAD3

The Time Stamp Recording is a function to record the following information at the same time when each frame is recorded.

- Trigger Time (unit of μ sec at minute and second of date)
- Event, IRIG lock(flag bit identification)
- Exposure time (Date and time minute, second, msec, a μ sec)

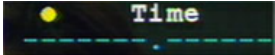
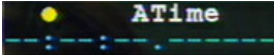
- 1) While in STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "TIMESTAMP" from the SYS MENU (Figure 3-45).
- 4) Use the arrows   to select Time Stamp.



```
TOP MENU > SYS MEN
CAFM DIS: OFF WHT >
FRM DISP: FRAME TI>
FRM TIME: TRIGGER >
REL TIME: FRAME TR>
TIMESTAMP: OFF ON
EXP TIME: K4comp8
```

Figure 3-45 TIMESTAMP

OFF	The time stamp is not recorded.
ON	The time stamp is recorded.

(Attention) Time is not displayed like  and , etc. When the setting of the time stamp is OFF, the frame counter display setting is "TIME" or "ABS.TIME", and it uses in the EST mode.

3.2.18 Exposure Timing Selection (EXP TIME)

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

The sensor exposure times for synchronized signal recording is different depending on the MEMRECAM GX-5 or other MEMRECAM series cameras (fx,ci cameras). When conducting synchronized recording with the MEMRECAM GX-5 and other MEMRECAM series cameras, the exposure times for all of the cameras must be coordinated.









- 1) While in 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. (Figure3-46)
- 4) Use the arrows   to select the exposure time.



Figure 3-46 EXP TIME

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

(Attention) 【HXLink User's Manual】 for synchronized recording with multiple camera connections between MEMRECAM GX-5 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 VIEW mode, press MENU  to display VIEW MENU.
- 2) Use the arrows   to select "GAIN" from VIEW 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(VIEW MENU)

3.3.1.2 Gain Settings for Playback Images

- 1) While in STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "GAIN" from the TOP MENU. (Figure 3-48)
- 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 3-48 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 VIEW mode, press MENU  to display VIEW MENU.
- 2) Use the arrows   to select "ENHANCE" from VIEW 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(VIEW MENU)

3.3.2.2 Enhance Settings for Playback Images

- 1) While in STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "ENHANCE" from the TOP MENU. (Figure3-50)
- 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 3-50 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 VIEW mode, press MENU  to display VIEW MENU.
- 2) Use the arrows   to select "GAMMA" from VIEW 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(VIEW MENU)

3.3.3.2 Gamma Settings for Playback Images

- 1) While in STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "GAMMA" from the TOP MENU. (Figure3-52)
- 3) Use the arrows   to select the gamma.

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








Figure 3-52 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 VIEW mode, press MENU  to display VIEW MENU.
- 2) Use the arrows   to select "CHROMA" from VIEW MENU. (Figure 3-53)
- 3) Use the arrows   to select the chroma.

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



Figure 3-53 CHROMA(VIEW MENU)

3.3.4.2 Chroma Settings for Playback Images

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

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








Figure 3-54 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 VIEW mode, press MENU  to display VIEW MENU.
- 2) Use the arrows   to select "KNEE" from VIEW MENU. (Figure 3-55)
- 3) Use the arrows   to select the knee.

OFF	Knee Correction OFF
ON	Knee Correction ON



Figure 3-55 KNEE(VIEW MENU)

3.3.5.2 Knee Settings for Playback Images

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

OFF	Knee Correction OFF
ON	Knee Correction ON








Figure 3-56 KNEE(TOP MENU)

3.3.6 RGB Matrix(RGB COR.)

RGB matrix that improves the color reproduction of the image can be corrected.

3.3.6.1 RGB Matrix Settings for Live Images






- 4) While in VIEW mode, press MENU  to display VIEW MENU.
- 5) Use the arrows   to select " RGB COR." from VIEW MENU. (Figure 3-57)
- 6) Use the arrows   to select the RGB Matrix.

OFF	RGB Matrix Correction OFF
ON	RGB Matrix Correction ON



Figure 3-57 RGB COR.(VIEW MENU)

3.3.6.2 RGB Matrix Settings for Playback Images

- 4) While in STOP mode, press MENU  to display the TOP MENU.
- 5) Use the arrows   to select " RGB COR." from the TOP MENU. (Figure3-58)
- 6) Use the arrows   to select the RGB Matrix.

OFF	RGB Matrix Correction OFF
ON	RGB Matrix Correction ON



Figure 3-58 RGB COR.(TOP MENU)

3.3.7 Luminance (LUMINANC)

The I/O characteristic of the image data (brightness) can be set. When LINEAR is selected, a full-scale value of the input data of the image is converted into the value of 8 bits (0~255) linear.

3.3.7.1 Luminance Settings for Live Images






- 1) While in VIEW mode, press MENU  to display VIEW MENU.
- 2) Use the arrows   to select " LUMINANC " from VIEW MENU. (Figure 3-59)
- 3) Use the arrows   to select the I/O characteristic of brightness.



Figure 3-59 LUMINANC(VIEW MENU)

NORMAL	The gain, the gamma, and the knee correction are effective.
LINEAR	The image data is converted linear and displays it. (The gain, the gamma, and the Nee correction are invalid)
CUSTOM	Custom setting for luminance. (Select to display the dialogue for "Custom Luminance") (* 1)

- * 1 CUSTOM settings cannot be made if selected with the J-PAD3. Use HXLink to set custom values. Also, refer to **【HXLink User's Guide】** for the method of setting with HXLink.

3.3.7.2 Luminance Settings for Playback Images






- 7) While in VIEW mode, press MENU  to display VIEW MENU.
- 8) Use the arrows   to select " LUMINANC " from VIEW MENU. (Figure 3-60)
- 9) Use the arrows   to select the I/O characteristic of brightness.



Figure 3-60 LUMINANC(TOP MENU)

NORMAL	The gain, the gamma, and the knee correction are effective.
LINEAR	The image data is converted linear and displays it. (The gain, the gamma, and the Nee correction are invalid)
CUSTOM	Custom setting for luminance. (Select to display the dialogue for "Custom Luminance") (* 1)

- * 1 CUSTOM settings cannot be made if selected with the J-PAD3. Use HXLink to set custom values. Also, refer to **【HXLink User's Guide】** for the method of setting with HXLink.






3.3.8 Black Balance (BLK BAL)

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

The MEMRECAM GX-5 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 STOP mode.

- 1) Put the lens cap on the camera so the sensor receives no light.
- 2) While in STOP mode, press MENU  to display the TOP MENU.
- 3) Use the arrows   to select "BLK BAL" from the TOP MENU. (Figure 3-61)
- 4) Use the arrows   to select the black balance.

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



Figure 3-61 BLK BAL(TOP MENU)

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

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

3.3.9 White Balance (WHT BAL)

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

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

3.3.9.1 White Balance Settings for Live Images






- 1) While in VIEW mode, press MENU  to display VIEW MENU.
- 2) Use the arrows   to select "WHT BAL" from VIEW MENU. (Figure 3-62)
- 3) Use the arrows   to select the white balance.



Figure 3-62 WHT BAL(VIEW MENU)

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

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

3.3.9.2 White Balance Settings for Playback Images






- 1) While in STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "WHT BAL" from the TOP MENU. (Figure 3-63)
- 3) Use the arrows   to select the white balance.



Figure 3-63 WHT BAL(TOP MENU)

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

3.3.10 Zoom Image (ZOOM)

Displays an enlarged or reduced image.

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

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

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

3.3.10.1 Zooming Live Images






- 1) While in VIEW mode, press MENU  to display VIEW MENU.
- 2) Use the arrows   to select "ZOOM" from VIEW MENU. (Figure 3-64)
- 3) Use the arrows   to select the zoom.



Figure 3-64 ZOOM(VIEW MENU)

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

3.3.10.2 Zooming Playback Images








- 1) While in 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 3-65)
- 4) Use the arrows   to select the zoom.



Figure 3-65 ZOOM(SYS MENU)

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

3.3.11 Scroll Image (SCROLL)

Moves the enlarged image for display.

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

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

3.3.11.1 Scrolling Live Images











- 1) While in VIEW mode, press MENU  to display VIEW MENU.
- 2) Use the arrows   to select "SCROLL" from VIEW MENU and press SET . (Figure 3-66)
- 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 3-66
SCROLL(VIEW MENU)

3.3.11.2 Scrolling Playback Images













- 1) While in 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 3-67)
- 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 3-67
SCROLL(SYS MENU)

3.3.12 Low Light Mode Settings (LOWLIGHT)

While in VIEW mode, set the low light mode from VIEW MENU on the J-PAD3.

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














- 1) While in VIEW mode, press LOWLIGHT  to switch to the low light mode.
- 2) If changing the low light settings, press MENU  to display VIEW MENU.
- 3) Use the arrows   to select "LOWLIGHT" from VIEW MENU. (Figure 3-68)
- 4) Use the arrows   to select the low light mode.



Figure 3-68
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.

Caution) If used with a C-Cam, the image quality will deteriorate at 250pps or less. Set at 500 pps or higher to improve it.







※ 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 VIEW can be adjusted while viewing the image.

3.3.13 Playback Memory Segment Selection (MEM SEG)

While in STOP mode, the memory segment to be played can be selected from the TOP MENU on the J-PAD3.

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

- 1) While in 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 3-69). 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.

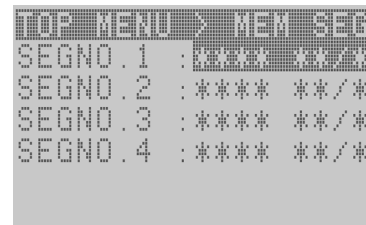


Figure 3-69 MEM SEG

(Figure 3-69 shows 4 memory segments that haven't been recorded yet)


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4

Save Settings

4.1 Items That Can Be Set

4.1.1 SAVE MENU Settings

While in 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
CAMERA	Camera number that has been selected
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). To return to the TOP MENU 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

4.2.1 Save Frame Range Settings (SAVE FRM)

In SAVE FRM, the playback range of the selected camera is displayed and the settings can be changed as the range saved to the USB recording media. Camera selection can also be set in CAMERA in the SAVE MENU.

The range set in SAVE FRM when one camera is selected is saved together with the image as the settings for each camera. (Figure 4-2)

If ALL is selected and the playback range for all of the cameras matches, the playback range is shown in SAVE FRM

(Figure 4-3). If there are cameras where the playback range does not match, astericks will be displayed. (Figure 4-4)

If ALL is selected and the range is set in SAVE FRM, there will be a temporary crash if the camera selection is switched to a single camera for a playback range for multiple cameras.

```
TOP MENU > SAVE ME
MCFF      :
CAMERA    : 3
FREE FRM  : 41427
SAVE FRM  : -2779 - +
REC FRM   : -2779 - +
VC TIFF   :
```

Figure 4-2 SAVE FRM
(Camera selection)

```
TOP MENU > SAVE ME
MCFF      :
CAMERA    : ALL 1 3
FREE FRM  : 41427
SAVE FRM  : -200 - +2
REC FRM   : -2779 - +
VC TIFF   :
```

Figure 4-3 SAVE FRM
(If the playback range matches)

```
TOP MENU > SAVE ME
MCFF      :
CAMERA    : ALL 1 3
FREE FRM  : 41427
SAVE FRM  : +*****
REC FRM   : -2779 - +
VC TIFF   :
```

Figure 4-4 SAVE FRM
(If the playback range does not match)

While in STOP mode, the setting for the frame range to be saved can be accessed from the J-PAD3 SAVE MENU.

- 1) First of all, use the arrows (◀▶) to select the camera that saves image, and displays the "STATUS" screen.

If the four-part display is selected when using 5 or more cameras with GX-5 8ch DRP, SAVE MENU cannot be opened with the following operation.

- 2) While in STOP mode, press MENU (MENU) to display the TOP MENU.
- 3) Use the arrows (▲▼) to select "SAVE MENU" from the TOP MENU and press SET (SET) to display the SAVE MENU.
- 4) Use the arrows (▲▼) to select "SAVE FRM" from the SAVE MENU and press SET (SET) (Figure 4-2).
- 5) 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 "—".

- 6) Press SET again to set the save frame range.

```
TOP MENU > SAVE ME
MCFF      :
CAMERA    : ALL 1 3
FREE FRM  : 41427
SAVE FRM  : 00100 - +
REC FRM   : -2779 - +
VC TIFF   :
```

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 STOP mode, the save method setting can be accessed from the J-PAD3 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 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 4-3).
- 4) Use the arrows   to set the save method functions and select the conditions with the arrows  .

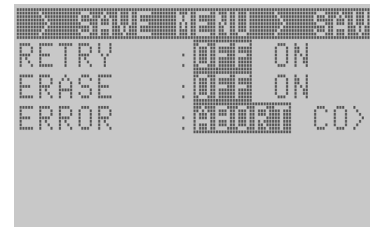


Figure 4-3 SAVE SET

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 REC mode, the image recorded from the J-PAD3 SAVE MENU can be saved as a video file (MCFF). The video file name of MCFFnnnn.MCF (nnnn is a 4 digit sequence) is automatically created.

If there are multiple camera heads connected to the GX-5 DRP, select the camera for image data storage and save the video file. The image data for all of the cameras can be batch saved to a video file.









- 1) While in 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 up/down arrows   to select CAMERA from the SAVE MENU (Figure 4-7) .
- 4) Use the left/right arrows   to select the camera to save the data. Set ALL to batch save data for all of the cameras.



Figure 4-7 SAVE MENU

- If saving the same range on all of the cameras as a batch
 - Select ALL and after setting the range with SAVE FRM, save the video file without changing the camera selection.
 - Select ALL to save the video file where asterisks are shown in the SAVE FRM.
- If saving the playback range set for each camera
 - Refer to **【4.2.1 Save Range Settings】** when changing the save range.

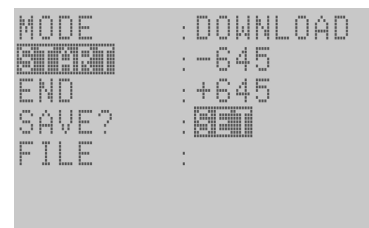





Figure 4-8
Save mode screen


- 5) Use the arrows   to select "MCFF" from the SAVE MENU and press SET  to display the transfer mode screen (Figure 4-4).

The 「SAVE?」 「SET」 will flash to prompt the save start.

Subsequent steps are identical to those found in **【2.11 Saving】**



Figure 4-9 Start download

- 7) Press SET on the J-PAD3  to start the save. (Figure 4-9) .

- 8) Confirm that the recording media access light is not lit and then remove the storage media. The USB LED on the front panel will go out.

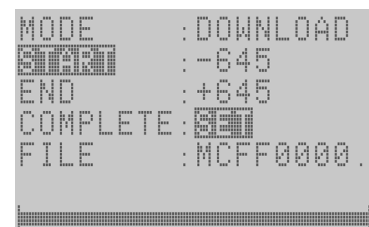


Figure 4-10 End download

4.2.4 Saving Images Larger than 4GB on USB

If saving to USB media using the GX-5, due to limitations to the FAT32 file system, files more than 4GB cannot be created. As a result, if the size of the MCFF to be saved on USB is greater than 4GB, the MCFF will be split into multiple files for saving. At this point, the second and subsequent files saved will have -V2, -V3 ... automatically added to the end of the standard file name.












- 1st file name : MCFF0000.MCF
- 2nd file name : MCFF0000-V2.MCF
- ...

If using the control software HXLink, multiple split and saved MCFF can be opened as a single scene for operation.

4.2.5 Saving Still Image Files (YC TIFF)

While in STOP mode, the image recorded from the J-PAD3 SAVE MENU can be saved as a still image file (YC TIFF). As for the file name of the still image file, MCYCnnnn.TIF (nnnn is generated in four columns of consecutive numbers) automatically.

If there are multiple camera heads connected to the GX-5 DRP, select the camera for storing the image data and save the still image file. Still image files for all of the cameras can be batch saved.

- 1) While in 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 "CAMERA" from the TOP MENU.
- 4) Use the left/right arrows   to select the camera to store the data. ALL is the setting to save the data for all of the cameras as a batch.
- 5) Use the arrows   to select "YC TIFF" from the SAVE MENU (Figure 4-5).
- 6) Press SET  to save the frame displayed at that point as a still image file.

When saving the file name formatted as "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.

- 7) Confirm that the recording media access light is not lit and then remove the storage media.
The USB LED on the front panel will go out.



Figure 4-11 SAVE MENU



Figure 4-12 YC TIFF



Figure 4-13 Saving YC TIFF

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 J-PAD3 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).

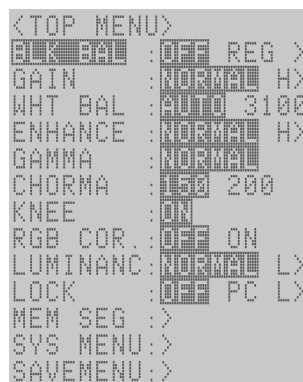





Figure 5-1 TOP MENU




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"
RGB COR.	RGB Matrix correction of playback image	Refer to Chapter 3 "Recording and Playback Settings"
LUMINANC	Brightness characteristic setting of playback image	Refer to Chapter 3 "Recording and Playback Settings"
LOCK	PC operation lock setting	Refer to this chapter
MEM SEG	Select the playback memory segment number	Refer to Chapter 3 "Recording and Playback Settings"
SYS MENU	Jump to the SYS MENU	Refer to this chapter
SAVE MENU	Jump to the SAVE MENU	Refer to Chapter 4 "Save Settings"

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

5.1.2 SYS MENU Settings

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

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

```




TOP MENU > SYS MEN
ID :000
DATETIME:13 11 18
OSD DISP:ALL
OSD MODE:ALWAYS S>
OSD TIME:TRIG CRNT
CAFM DIS:OFF WHT >
FRM DISP:FRAME TI>
FRM TIME:TRIGGER >
REL TIME:FRAME TR>
TIMESTAMP:ON
EXP TIME:K4compat
SYNCTIME:ASVNC GX>
SYNC SEL:INT EST1>
EST VIEW:ON
VIDEOOUT:ON
ZOOM :FIT2
SCROLL :0 0
BEEP :ON OFF
AUTOVIEW:OFF AUTO>
WARNING :>
TRIG SET:>
SIG SET :>
SYS SET :>
INFO :>

```

Figure 5-2 SYS MENU

Table 5-2 SYS MENU Settings

Settings	Setting Details	
ID	ID number setting	Refer to this chapter
DATETIME	Date and time setting	Refer to this chapter
OSD DISP	Display/do not display superimposed information	Refer to this chapter
OSD MODE	Display/do not display superimposed information by camera mode	Refer to this chapter
OSD TIME	Trigger time display setting	Refer to this chapter
CAFM DIS	Display/do not display mark for center of image	Refer to this chapter
FRM DISP	Frame counter display setting	Refer to this chapter
FRM TIME	Frame time standard setting	Refer to this chapter
REL TIME	Relative time display settings	
TIMESTAMP	Time stamp recording setting	Refer to Chapter 3 "Recording and Playback Settings"
EXP TIME	Exposure timing setting	Refer to Chapter 3 "Recording and Playback Settings"
SYNC TIME	Synchronized time setting	Refer to Chapter 3 "Recording and Playback Settings"
SYNC SEL	Synchronized signal setting	Refer to Chapter 3 "Recording and Playback Settings"
EST VIEW	Synchronization settings for the VIEW mode during external synchronization	
VIDEOOUT	Display/do not display image	Refer to this chapter
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	Refer to this chapter
AUTOVIEW	Automatic switch to VIEW mode	Refer to this chapter
WARNING	Display/do not display warnings	Refer to this chapter
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)	Refer to this chapter

After completing the settings 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	Refer to this chapter
MAC ADDR	MAC address display (cannot be set)	Refer to this chapter
RESET	Reset settings	Refer to this chapter
VIDEO OUT	Video output method settings	Refer to this chapter
REBOOT	Reboot network	Refer to this chapter






After completing the settings 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 HXLink) 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.

OFF	PC operation allowed
PC LOCK	PC operation prohibited



Figure 5-4 LOCK

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.

```
TOP MENU > SYS MEN
ID : 000
DATE TIME: 13 11 20
OSD DISP: ALL
OSD MODE: ALWAYS S>
OSD TIME: TRUE CRNT
CAFM DIS: OFF WHT >
```

Figure 5-6 DATETIME

5.2.4 Display/Hide 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)

```
TOP MENU > SYS MEN
ID : 000
DATE TIME: 13 11 20
OSD DISP: ALL
OSD MODE: ALWAYS S>
OSD TIME: TRUE CRNT
CAFM DIS: OFF WHT >
```

Figure 5-7 OSD DISP

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

OFF



FRAME



ALL

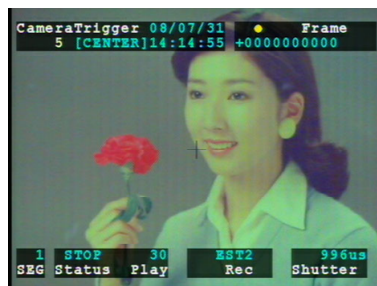










Figure 5-8 OSD DISP Settings

5.2.5 Display/Hide Settings for Information Superimposed on the Image (OSD MODE)

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

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

```
TOP MENU > SYS MEN
ID :000
DATETIME:13 11 20
OSD DISP:ALL
OSD MODE:ALWAYS S>
OSD TIME:TRIG CRNT
CAM DIS:OFF WHT >
```









Figure 5-9 OSD MODE

ALWAYS
STOP

Superimposed information is displayed in all camera mode.
Superimposed information is displayed only in the STOP mode.

5.2.6 Trigger Time Display Setting of Image (OSD TIME)

The trigger time to which the superimposition is displayed in the image can be set to the trigger time or the present 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 " OSD TIME " from the SYS MENU (Figure 5-10).
- 4) Use the arrows   to select the trigger time display setting.

```
TOP MENU > SYS MEN
ID :000
DATETIME:13 11 20
OSD DISP:ALL
OSD MODE:ALWAYS S>
OSD TIME:TRIG CRNT
CAM DIS:OFF WHT >
```

Figure 5-10 OSD TIME

TRIG
CRNT

Display the trigger time
Display the present time (clock display)

During VIEW, ARM, REC modes when CRNT is selected and the current time is displayed, the OSD title shown is the Date Time (normal is Trigger).

TRIG

CRNT



Figure 5-11 Screen Display

5.2.7 Display/Hide 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 5-12).
- 4) Use the arrows   to select display/do not display for the center mark of the image. (Figure 5-13)



Figure 5-12 CAFM DIS

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

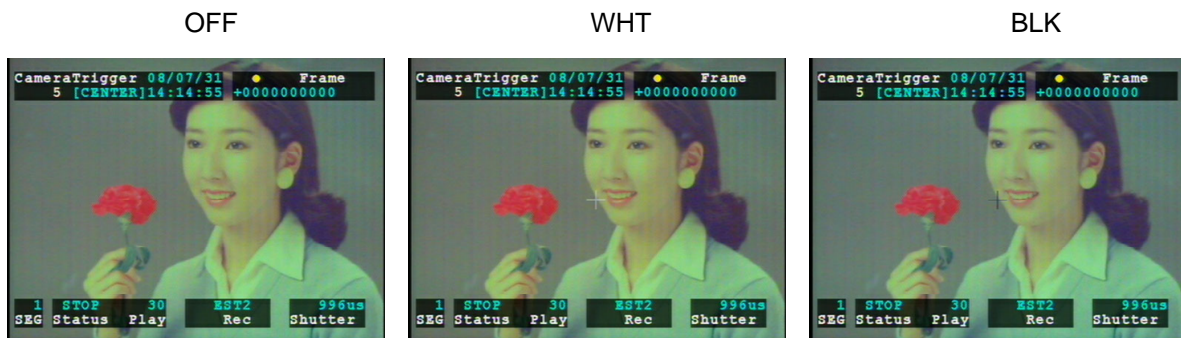


Figure 5-13 CAFM DIS Settings

5.2.8 Frame Counter Display Settings (FRM DISP)

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









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



Figure 5-13 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

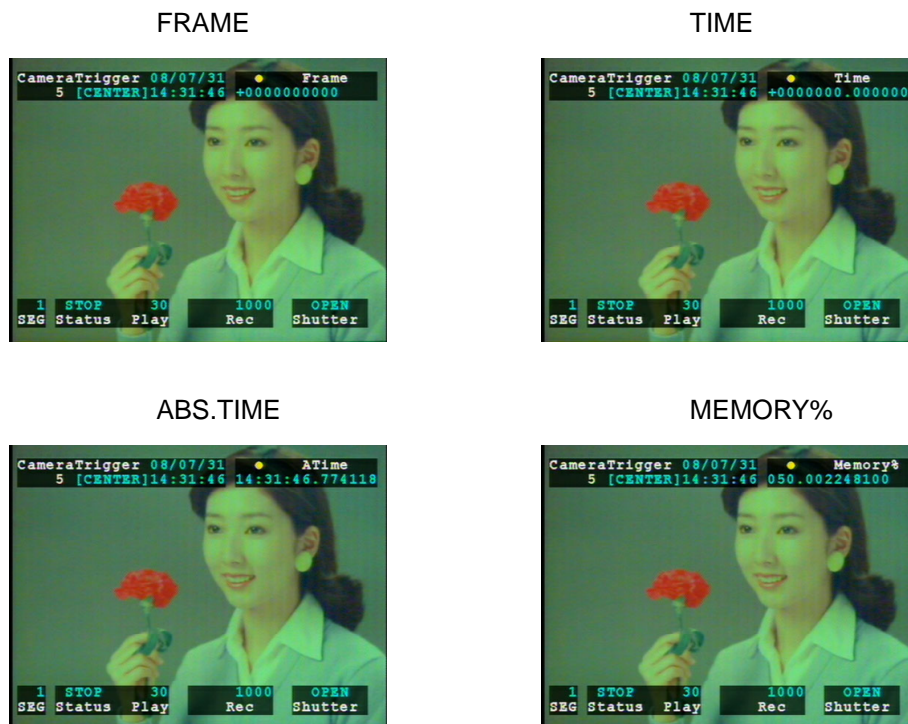


Figure 5-15 FRM DISP Settings

5.2.9 Selection of the Frame Time Standard (FRM TIME)

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

- **Trigger Signal Input Time**
Using the trigger signal input time during recording as the standard, the time corresponding to the recording speed is calculated for the next frame (Figure 5-15). 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 5-15). If using the time stamp function, since the image and the time information is saved in the memory, the frame time for the EST synchronized signal recording is also displayed.
However, if the automatic exposure function (AE) is set, the time between each frame is not uniform.

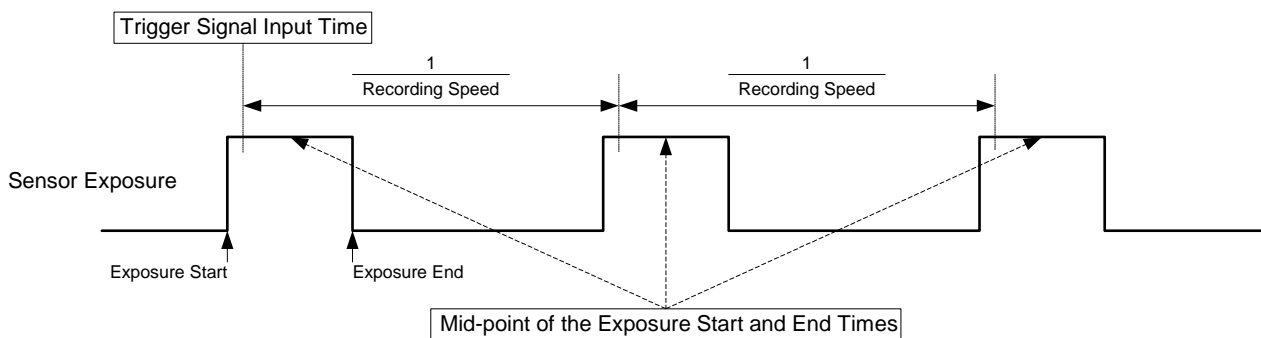


Figure 5-16 Standard Timing for the Frame Time

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



Figure 5-17 FRM TIME

TRIGGER	Use the trigger signal input time as the standard
EXPOSURE	Use the mid-point of the exposure start and end time as the standard

5.2.10 Image Display/Hide 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 5-18).
- 4) Use the arrows   to select display/do not display the image.



Figure 5-18 VIDEOOUT

OFF	Do not display the image
ON	Display the image

5.2.11 Remote Control Operation Sound Settings (BEEP)

The operation sound for the remote control J-PAD3 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 5-19).
- 4) Use the arrows   to select the remote control operation sound.




Figure 5-19 BEEP

ON	Operation sound
OFF	No operation sound

5.2.12 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.









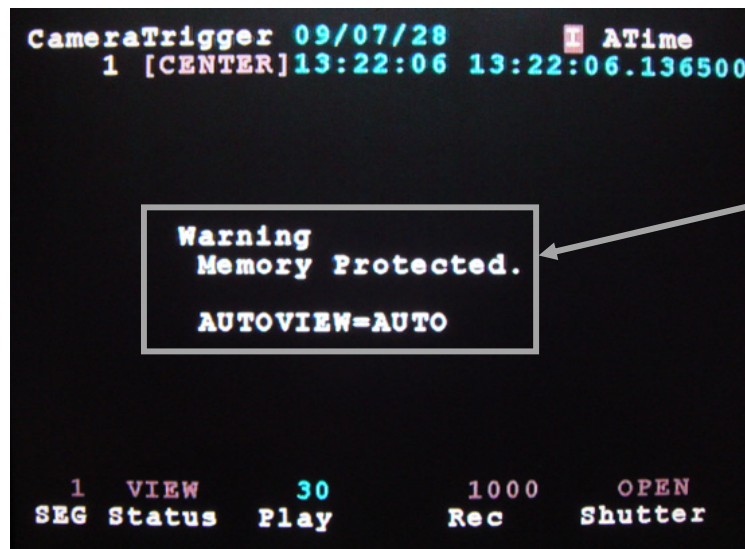
- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "AUTOVIEW" from the SYS MENU (Figure 5-20a).
- 4) Use the arrows   to select the auto view function.



Figure 5-20a AUTOVIEW


OFF Auto view function OFF

AUTO The auto view function is repeated until the final memory segment (switches to memory segments where recording has been completed, cannot overwrite images)
 * At this point, a warning message is shown prohibiting overwriting on the video display screen (Figure 5-20b)



Warning message

Figure 5-20b Overwrite prohibition warning message at the time of the "AUTO" setting

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)

(Attention) 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 **【2.11 Saving】** or **【HXLink User's Manual】** for the method of saving images.

5.2.13 Display/Hide 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.
- **Warning of Inconsistent Black Balance Data (BLK BAL)**
Obtaining the black balance just prior to filming is recommended when correcting the fixed pattern noise unique to the sensor to get a higher resolution image quality. The identical frame size, recording rate and shutter settings as when filming are required for obtaining the black balance.

If changing the frame size, recording rate or shutter settings after obtaining the black balance, a warning can be displayed. If the black balance is obtained just when a warning is displayed, the black balance can be corrected.

However, there is no need for the warning to be displayed for applications obtaining the black balance for each filming. In this case, the warning of inconsistent black balance data can be set to OFF.










- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the arrows   to select "SYS MENU" from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the arrows   to select "WARNING" from the SYS MENU and press SET  to display the WARNING sub-menu. (Figure 5-21)
- 4) Select the warnings to be set and use the arrows   to select display/do not display for the warnings.














Figure 5-21 WARNING

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

5.2.14 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)
- Display the port number while displaying image.
- Kind of camera head under connection

- 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 5-22).
- 4) Use the arrows   and the arrows   to verify all of the system information.

















```
> SYS MENU > INFO
MODEL   : ECAM GX-5
VERSION : 1.53
CID     : 1181
MEM SIZE: 8540
REVISION: 1.02-1.07
NETWORK : ETHERNET
```

Figure 5-22 INFO

5.2.15 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 5-23).
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 5-24).

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



```
< SYSTEM SETUP MEN
IP ADDR  : 172.021.0
MAC ADDR : 00:05:61:
RESET    :
VIDEO    : PAL
REBOOT   :
```

Figure 5-23 IP ADDR









```
< SYSTEM SETUP MEN
IP ADDR  : 172.021.0
MAC ADDR : 00:05:61:
RESET    :
VIDEO    : PAL
REBOOT   :
```

Figure 5-24 REBOOT

5.2.16 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 5-25).



```
< SYSTEM SETUP MEN
IP ADDR :172.021.0
MAC ADDR:00:05:61:
RESET   :
VIDEO   :NTSC PAL
REBOOT  :
```

Figure 5-25 RESET

- 3) Use the arrows   to select "REBOOT" and press SET  (Figure 5-26).
Restart the system using "REBOOT" to show the new settings.










```
< SYSTEM SETUP MEN
IP ADDR :172.021.0
MAC ADDR:00:05:61:
RESET   :
VIDEO   :NTSC PAL
REBOOT  :
```

Figure 5-26 REBOOT

5.2.17 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 5-27).
- 3) Use the arrows   to select the video output method.



```
< SYSTEM SETUP MEN
IP ADDR :172.021.0
MAC ADDR:00:05:61:
RESET   :
VIDEOOUT:NTSC PAL
REBOOT  :
```

Figure 5-27 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 5-28).
Restart the system using "REBOOT" to show the video method.



```
< SYSTEM SETUP MEN
IP ADDR :172.021.0
MAC ADDR:00:05:61:
RESET   :
VIDEO   :NTSC PAL
REBOOT  :
```

Figure 5-28 REBOOT

5.2.18 Frame Relative Time Display Settings (REL TIME)

It is possible to select the relative time standard when setting the frame counter display (FRM DISP) as the relative time (TIME) or the frame time display setting (FRM TIME) as the exposure center time (EXPOSURE).

Trigger Frame Time Standard

Sets the frame relative time standard as the trigger frame time.

The frame relative time becomes the time when the trigger frame time is subtracted from the frame time.

Trigger Signal Time Standard

Sets the frame relative time standard as the trigger signal input time.

The frame relative time becomes the time when the trigger signal input time is subtracted from the frame time.









- 1) While in the STOP mode, press MENU  to display the TOP MENU.
- 2) Use the up/down arrows   to select SYS MENU from the TOP MENU and press SET  to display the SYS MENU.
- 3) Use the up/down arrows   to select REL TIME from the SYS MENU (Figure 5-29) .
- 4) Use the left/right arrows   to select the frame relative time standard.



Figure 5-29 REL TIME

FRAME	Trigger frame time standard
TRIGGER	Trigger signal time standard

6

Troubleshooting

6.1 Troubleshooting

The following suggestions are provided on the causes of potential problems during use of the MEMRECAM GX-5 and their solutions.

6.1.1 The VIEW Mode Cannot Be Accessed

Cause ①

The view mode can't be accessed when any camera head is not connected with an effective port.

Solution

Please do the camera configuration setting with the camera head connected. Please refer to **【2.4 camera configuration setting】** for the camera configuration settings.

Cause ②

It may not become VIEW Mode by warning message which is displayed.

Solution

Please execute VIEW after pressing "STOP", and deleting the warning message.

6.1.2 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 **【3.2.8 Memory Segment Settings】**.
- ◆ Select a recording method other than the AUTO mode from **【3.2.10 Recording Method Selection】** to enable data to be overwritten.

(Attention) 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 **【2.11 Saving】** or **【HXLink 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 **【3.2.8 Memory Segment Settings】**.
- ◆ Turn the auto view function OFF or set to LOOP according to **【5.2.12 Auto View Function Settings】** to enable overwriting data.

(Attention) 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 **【2.10 Saving】** or **【HXLink User's Manual】** for the method of saving images.

6.1.3 Trigger Input Does Not Work With the Remote Control J-PAD3

Cause

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

Solution

Input external trigger signals from the J1 cable TRIG1 or J3 cable TRIG2 (option) during burst recording.

6.1.4 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 **【3.2.9 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

6.1.5 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 **【3.2.12 Synchronized Signal Selection】**.

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 **【3.2.12.2.1 Precautions for Use, 【7.5 Input/Output Connector】and【APPENDIX B】**. Also, follow **【3.2.14 External Input/Output Signal Polarity Selection】** to make sure that the correct polarity is either positive or negative to enable EST synchronized signal recording with the desired timing

6.1.6 Not Synchronized with the IRIG Time

Cause ①

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

Solution

Set the synchronization time to IRIG time according to **【3.2.11 Synchronized Timing Selection】** .

Cause ②

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

Solution

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

6.1.7 Response to System Crashes

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

6.1.8 About “Don’t turn off the power!”

Camera correction data is recorded on the camera head for the MEMRECAM GX-5 in order to correct the black level of the sensor and to remove noise elements. The camera correction data is required for displaying the camera image.

GX-5 saves the camera correction data recorded on the camera head to the DRP non-volatile memory and normally it is possible to shorten the DRP startup time by retrieving the camera correction data from the DRP non-volatile memory.

During startup, the DRP communicates with the connected camera head and if there is no camera correction data stored in the non-volatile memory, that camera correction data is saved in the DRP non-volatile memory.

With the P2-Cam camera head, saving the camera correction data to the DRP non-volatile memory takes about 10 seconds.

With 8 P2-Cam camera heads connected, it takes about 80 seconds. Also, it takes about 70 seconds if using the HR-Cam camera head.

Caution) When starting up the GX-5 DRP and saving camera correction data to the DRP non-volatile memory, “Don’t turn off power!” (Figure 8) is displayed on the video, so do not turn off the power to the DRP during that time.

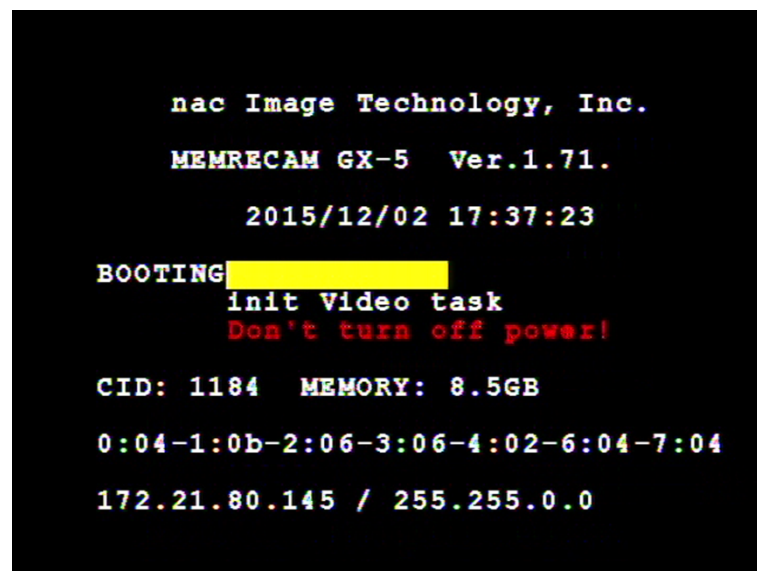


Figure 8 Camera Correction Data Startup Screen when Saving

If the DRP power is cut off while writing to the DRP non-volatile memory, the data in the DRP non-volatile memory may not be retrieved and the camera image and the image data saved in the image memory may not be displayed.

In this case, initialization (removal of camera correction data) of the DRP non-volatile memory is performed by the PC control software and then the camera correction data must be saved again to the DRP non-volatile memory from the camera head.

Initialization of the DRP non-volatile memory is performed using the HXLink control software. Refer to “System Settings (HXUtility) → GX-5 Camera Correction Data Removal” in the HXLink User’s Guide for this process.

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7

Specifications

7.1 Imager

7.1.1 P2-Cam / S2-Cam

7.1.1.1 Image Sensor

In general, CCD camera used well and the same optical size 1/2 inch 300,000 pixel color or monochrome solid state image sensor(CMOS sensor)

Pixel size 9.9 μ m pixels

Maximum valid area size 6.34(H) x 4.75(V)mm

7.1.1.2 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、80,000、100,000
- 2) With Custom Recording speeds 50~100,000 pps、1pps increments
- 3) Using EST and Custom Recording speed Function
0~113,636 pps
Note) pps: picture per second, frames/second

7.1.1.3 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 : VGA	(1,000pps or less)	640(H)X480(V)	6.34(H)X4.75(V) mm
Split 4:3	(1,000pps or less)	576(H)X432(V)	5.70(H)X4.28(V) mm
Split 4:3	(1,500pps or less)	512(H)X384(V)	5.07(H)X3.80(V) mm
Split 4:3	(2,000pps or less)	448(H)X336(V)	4.44(H)X3.33(V) mm
Split 4:3	(3,000pps or less)	384(H)X288(V)	3.80(H)X2.85(V) mm
QVGA	(4,000pps or less)	320(H)X240(V)	3.17(H)X2.37(V) mm
Split 4:3	(6,000pps or less)	256(H)X192(V)	2.53(H)X1.90(V) mm
Split 4:3	(10,000pps or less)	192(H)X144(V)	1.90(H)X1.43(V) mm
Split 4:3	(15,000pps or less)	128(H)X96(V)	1.27(H)X0.95(V) mm
Split 4:3	(50,000pps or less)	64(H)X48(V)	0.63(H)X0.48(V) mm
Split	(100,000pps or less)	32(H)X16(V)	0.32(H)X0.16(V) mm

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

Note 2) The sensor central accuracy relative to the central light axis is ± 0.28 mm.

Note 3) 1,000pps or less is 50, 60, 100, 250, 500, 750, and 1,000. However, the shutter time of 50 and 60pps is 10ms at most.

<NOTE>

When with C-Cam mixed, it performs within C-Cam preset

When with u-Cam mixed, the frame rate goes up to 1000fps (100/250/500/1000pps) at fixed resolution of 640(H)x480(V)

- 2) Custom Settings for the Frame Size
The horizontal pixels can be set in 32 pixel increments, and the vertical pixels can be set in 16 pixel increments.

7.1.1.4 Sensitivity

- 1) Color ISO1,000 (F/4, gain NORMAL, 1000pps)
Corresponds to ISO500/1,000/2,000 (gain LOW/NORMAL/HIGH)
- 2) Black and White ISO4,000 (F/4, gain NORMAL, 1000pps)
Corresponds to ISO2,000/4,000/8,000 (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

7.1.1.5 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 640X480)

Recording Speed (pps) Exposure Time (Sec)	50	60	100	250	500	750	1000
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.

Note 6) It is horizontal pixel count 608 or less that can set the shutter for 1/333,333 seconds.

Note 7) Designate the frame rate priority or frame size priority and set.

Note 8) There may be times when settings are not possible even if the shutter exposure time settings are displayed on the menu due to the recording conditions or the combination of varying types of cameras (P2-Cam、S2-Cam、HR-Cam、C-Cam、μ-Cam) . In this case, the shutter exposure times return to the settings before the changes were made.

3) Custom Shutter Exposure Times

1~9996 microseconds, 1 or 2 microsecond increments

Possible Settings and Intervals for Exposure Times

Photographic Speed (pps)	Pixels (HxV)	Setting (us)		Setting Intervals (us)
		Maximum	Minimum	
100 or less	640x480	9996	4	1 or 2
250	640x480	3996	4	1 or 2
500	640x480	1995	4	1 or 2
1,000	640x480	997	4	1 or 2
2,000	448x336	497	3	1 or 2
3,000	384x288	329	2	1 or 2
4,000	320x240	246	2	1
6,000	256x192	163	2	1
10,000	192x144	96	1	1
15,000	128x96	63	1	1
50,000	64x48	17	1	1
100,000	32x16	7	1	1

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

7.1.1.6 Camera Cable Length

With the RX-5 pencil, all of the camera cable lengths must be identical but with the GX-5, the cable length for each camera can be different.

If using an extension cable and using together with a BB1 UNIT with a maximum length of about 9m, the maximum length can be extended to about 18m.

Example 1) Camera head 0.6m + extension cable 8m = 8.6m

Example 2) Camera head 0.6m + extension cable 8m + BB1 UNIT 5m + extension cable 4m = 17.6m

Note) One extension cable can be used between the camera and the BB1 UNIT.
Connecting a 4m + 4m extension cable instead of using a 8m cable is not allowed.

7.1.1.7 Lens Mount

NF mount, SPM lens, C mount (NF-C mount conversion adapter : option)

* SPM lens : nac G resistant lens (P2-Cam, S2-Cam dedicated product)

Note 1) This product is a NF mount. If using a lens with a non-NF mount and adapter (C mount, F mount etc), there is a risk of damaging the mount.

Note 2) Back adjustment is required when replacing the NF mount and SPM lens.

7.1.2 HR-Cam

7.1.2.1 Image Sensor

About 2.2 inch 1,220,000 pixels in color or black/white solid state image sensor (CMOS sensor)

Pixel size 21.7um pixels

Maximum valid area size 27.78(H) x 20.83(V)mm

7.1.2.2 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、80,000、100,000

2) With Custom Recording speeds
50~100,000 pps、1pps increments

3) Using EST and Custom Recording speed Function
0~113,636 pps

Note) pps: picture per second, frames/second

7.1.2.3 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	(1,000pps or les)	1280(H)x960(V)	27.78(H)X20.83(V) mm
Split 4:3	(1,000pps or les)	1152(H)x864(V)	24.99(H)X18.74(V) mm
Split 4:3	(1,500pps or les)	1024(H)x768(V)	22.22(H)X16.66(V) mm
Split 4:3	(2,000pps or les)	896(H)x672(V)	19.44(H)X14.58(V) mm
Split 4:3	(2,500pps or les)	768(H)x576(V)	16.66(H)X12.50(V) mm
VGA	(4,000pps or les)	640(H)x480(V)	13.89(H)X10.42(V) mm
Split 4:3	(6,000pps or les)	512(H)x384(V)	11.11(H)X8.33(V) mm
CIF	(10,000pps or les)	384(H)x288(V)	8.33(H)X6.24(V) mm
Split 4:3	(15,000pps or les)	256(H)x192(V)	5.55(H)X4.17(V) mm
Split 4:3	(50,000pps or les)	128(H)x96(V)	2.78(H)X2.08(V) mm
Split 4:3	(100,000pps or les)	64(H)x32(V)	1.39(H)X0.69(V) mm

Note 1) pps(picture per second) is the unit for recording rate =frames per second

Note 2) The number of pixels saved to the memory is the same as the valid number of pixels.

Note 3) The precision for the sensor center to the optical axis center is ± 0.5 mm

Note 4) 1,000pps or less is 50, 60, 100, 250, 500, 750, 1000.

However, the maximum 50, 60pps shutter time is 10ms.

Note) The joint resolution for P2-Cam and S2-Cam is set at double that of the P2-Cam and S2-Cam in both the horizontal and vertical directions.

When combining with C-Cam, it can only be operated in the range preset on the C-Cam.

When with μ -Cam mixed, the frame rate goes up to 1000fps (100/250/500/1000pps) at fixed resolution of 1280(H)x960(V)

2) Custom Settings for Frame Size

The number of horizontal pixels can be set in 64 pixel intervals and the number of vertical pixels can be set in 32 pixel intervals.

7.1.2.4 Sensitivity

- 1) Color ISO5,000 (F/4, gain NORMAL, 1000pps)
Corresponds to ISO2,500/5,000/10,000 (gain LOW/NORMAL/HIGH)
- 2) Black and White ISO20,000 (F/4, gain NORMAL, 1000pps)
Corresponds to ISO10,000/20,000/40,000 (gain LOW/NORMAL/HIGH)

7.1.2.5 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 : Pixels1280X960)

Recording Speed (pps) Exposure Time (Sec)	50	60	100	250	500	750	1000
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) The exposure time cannot be set longer than 1/ frame rate.

Note 2) ○ refers to shutter speeds that can be set, × and △ refer to shutter speeds that cannot be preset.

Note 3) △ refers to a custom shutter that can be set. × refers to a custom shutter that cannot be set.

Note 4) * refers to an open shutter.

Note 5) If there is a shutter speed that cannot be set by changing the frame rate or the number of pixels, the shutter will be open or the minimum exposure time will be used. If set to an open shutter or the minimum exposure time, these settings will be retained even if the frame rate or the number of pixels is changed.

Note 6) Designate the frame rate priority or frame size priority and set.

Note 7) There may be times when settings are not possible even if the shutter exposure time settings are displayed on the menu due to the recording conditions or the combination of varying types of cameras (P2-Cam、S2-Cam、HR-Cam、C-Cam、μ-Cam) . In this case, the shutter exposure times return to the settings before the changes were made.

3) Custom Shutter Exposure Times

1~9996 microseconds, 1~3 microsecond increments

Possible Settings and Intervals for Exposure Times

Recording Speed (pps)	Pixels (HxV)	Setting (us)		Setting Intervals (us)
		Maximum	Minimum	
100 or less	1280x960	9992	1	2 or 3
250	1280x960	3991	1	2 or 3
500	1280x960	1992	1	2 or 3
1,000	1280x960	993	1	2 or 3
1,500	1024x768	659	1	2 or 3
2,000	896x672	494	1	1 or 2
2,500	768x576	328	1	1 or 2
4,000	640x480	245	1	1 or 2
6,000	512x384	162	1	1 or 2
10,000	384x288	97	1	1
15,000	256x192	47	1	1
50,000	128x96	18	1	1
100,000	64x32	8	1	1

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

7.1.2.6 Camera Cable Length

With the RX-5 pencil, all of the camera cable lengths must be identical but with the GX-5, the cable length for each camera can be different.

Note) If using the HR-Cam, the camera cable can be straight (3,4,5m) or angled (3, 4m) , with extension cables of 4, 6, 8m. It is possible to extend to a maximum length of 9m by using extension cables so if extending, make sure to use the 3m camera cable (the 4, 5m are not in spec). As a result, there are two patterns for the extended length, 7m and 9m.

(If using the 8m extension cable, the 11m length is outside of the 9m specification and is not guaranteed.)

Also, if using the optional BB1 UNIT, the maximum length can be extended to a maximum of 18m.

Example) Camera cable 3m + extension cable 6m + BB1 UNIT 5m + extension cable 4m = 18m

7.1.2.7 Lens Mount

F mount, C mount (option), NM mount (option), G resistant lens mount (option)

7.1.3 C-Cam

7.1.3.1 Image Sensor

In general, the same optical size as the CCD camera in use, specifically, 1/2 inch 300,000 pixels in color or black/white solid state image sensor (CMOS sensor)

Pixel size 11.2 μ m pixels

Maximum valid area size 7.17(H) x5.38(V)mm

7.1.3.2 Recording Speeds

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

Note) There is no custom frame size or custom frame rate function.

7.1.3.3 Recording Speed and Pixels

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

Frame Size (Maximum Recording Speed) Pixels			Image Area Size
Full:VGA	(1,000pps or less)	640(H)X480(V)	7.17(H)X5.38(V) mm
Split 4:3	(1,000pps or less)	576(H)X432(V)	6.45(H)X4.84(V) mm
Split 4:3	(1,500pps or less)	512(H)X384(V)	5.73(H)X4.30(V) mm
Split 4:3	(2,000pps or less)	448(H)X336(V)	5.02(H)X3.76(V) mm
Split 4:3	(2,500pps or less)	384(H)X288(V)	4.30(H)X3.23(V) mm
QVGA	(4,000pps or less)	320(H)X240(V)	3.58(H)X2.69(V) mm
Split 4:3	(5,000pps or less)	256(H)X192(V)	2.87(H)X2.15(V) mm
Split 4:3	(8,000pps or less)	192(H)X144(V)	2.15(H)X1.61(V) mm
Split 4:3	(10,000pps or less)	128(H)X96(V)	1.43(H)X1.08(V) mm
Split 4:3	(15,000pps or less)	64(H)X48(V)	0.72(H)X0.54(V) mm
Split	(25,000pps or less)	32(H)X16(V)	0.36(H)X0.18(V) mm

Note 1) pps (picture per second、frames per second)

Note 2) The number of pixels saved to the memory is the same as the valid number of pixels.

Note 3) The precision for the sensor center to the optical axis center is ± 0.33 mm

Note 4) 1,000pps or less is 50, 60, 100, 250, 500, 750, 1,000. However, the maximum 50, 60pps shutter time is 10ms.

Note 5) If selecting 250pps or less when using the C-Cam, the image quality will deteriorate (grainy image) with the shutter open but closing the shutter (1/500 or less) will improve the image quality.

Note) When with μ -Cam mixed, the frame rate goes up to 1000fps (100/250/500/1000pps) at fixed resolution of 640(H)x480(V)

7.1.3.4 Sensitivity

- 1) Color ISO8,000 (F/4, gain NORMAL, 1000pps)
Corresponds to ISO4,000/8,000/16,000 (gain LOW/NORMAL/HIGH)
- 2) Black and White ISO50,000 (F/4, gain NORMAL, 1000pps)
Corresponds to ISO25,000/50,000/100,000 (gain LOW/NORMAL/HIGH)

7.1.3.5 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

Shutters with Fixed Exposure Time Settings (Example : Pixels640X480)

Recording Speed (pps) Exposure Time (Sec)	50	60	100	250	500	750	1000
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	○	○	○	○	○	○	○

Note 1) The exposure time cannot be set longer than 1 / frame rate.

Note 2) ○ refers to shutter speeds that can be set, × and △ refer to shutter speeds that cannot be preset.

Note 3) △ refers to a custom shutter that can be set.

Note 4) * refers to an open shutter. (= 1/frame rate)

Note 5) If there is a shutter speed that cannot be set by changing the frame rate or the number of pixels, the shutter will be open or the minimum exposure time will be used. If set to an open shutter or the minimum exposure time, these settings will be retained even if the frame rate or the number of pixels is changed.

Note 6) Designate the frame rate priority or frame size priority and set.

Note 7) # indicates that the shutter may be set but the image quality deteriorates (grainy image) if the shutter is open but closing the shutter (1/500 or less) improves the image quality.

Note 8) There may be times when settings are not possible even if the shutter exposure time settings are displayed on the menu due to the recording conditions or the combination of varying types of cameras (P2-Cam、S2-Cam、HR-Cam、C-Cam、μ-Cam) . In this case, the shutter exposure times return to the settings before the changes were made.

3) Custom Shutter Exposure Times

14~9993 microseconds, 2 or 3 microsecond increments

Possible Settings and Intervals for Exposure Times

Recording Speed (pps)	Pixels (HxV)	Setting (us)		Setting Intervals (us)
		Maximum	Minimum	
100 以下	640x480	9993	16	2 or 3
250	640x480	3993	16	2 or 3
500	640x480	1993	16	2 or 3
1,000	640x480	993	16	2 or 3
2,000	448x336	493	16	2 or 3
2,500	384x288	393	16	2 or 3
4,000	320x240	327	14	2 or 3
5,000	256x192	193	16	2 or 3
8,000	192x144	118	16	2 or 3
10,000	128x96	93	16	2 or 3
15,000	64x48	60	15	2 or 3
25,000	32x16	33	16	2 or 3

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

7.1.3.6 Camera Cable Length

With the RX-5 pencil, all of the camera cable lengths must be identical but with the GX-5, the cable length for each camera head can be different.

If using an extension cable and using together with a BB1 UNIT with a maximum length of about 9m, the maximum length can be extended to about 18m.

Example 1) Camera head 0.6m + extension cable 8m = 8.6m

Example 2) Camera head 0.6m + extension cable 8m + BB1 UNIT 5m + extension cable 4m = 17.6m

Note) One extension cable can be used between the camera and the BB1 UNIT.

Connecting a 4m + 4m extension cable instead of using a 8m cable is not allowed.

7.1.3.7 Lens Mount

C mount

7.1.3.8 Burst Recording with C-Cam

When recording with C-Cam in Burst recording mode, trigger frame shall be shifted by 1 frame.

It starts recording a frame before the frame triggered (start of trigger) and finish recording a frame before the frame triggered (end of trigger)

7.1.3.9 Precautions during C-Cam Use

If there is no tripod plate or camera holder, keep at an ambient temperature up to 30°C.

Alternatively, use under the following conditions.

- ① Use a tripod plate.
- ② Use a camera holder.

7.1.4 μ -Cam

7.1.4.1 Image Sensor

In general, the same optical size as the CCD camera in use, specifically, 1/3 inch 300,000 pixels in color or black/white solid state image sensor (CMOS sensor)

Pixel size 7.4 μ m pixels

Maximum valid area size 4.74(H) x 3.55(V)mm

7.1.4.2 Recording Speeds

With Preset Recording speeds 100, 250, 500, 1,000

Note) There is no custom frame size or custom frame rate function.

7.1.4.3 Recording Speed and Pixels

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

Frame Size (Maximum Recording Speed) Pixels		Image Area Size
Full:VGA	(250pps or less)	640(H)X480(V) 4.74(H)X3.55(V) mm
Split	(500pps)	640(H)X456(V) 4.74(H)X3.37(V) mm
Split	(1,000pps)	640(H)X210(V) 4.74(H)X1.55(V) mm

Note 1) pps (picture per second、frames per second)

Note 2) The number of pixels saved to the memory is the same as the valid number of pixels.

Note 3) The precision for the sensor center to the optical axis center is ± 0.165 mm

Note 4) 250pps or less is 100, 250pps.

7.1.4.4 Sensitivity

- | | | |
|-----|-----------------|---|
| 1) | Color | ISO2,000 (F/4, gain NORMAL, 1000pps)
Corresponds to ISO1,000/2,000/4,000 (gain LOW/NORMAL/HIGH) |
| 2) | Black and White | ISO8,000 (F/4, gain NORMAL, 1000pps)
Corresponds to ISO4,000/8,000/16,000 (gain LOW/NORMAL/HIGH) |

7.1.4.5 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

Shutters with Fixed Exposure Time Settings (Example : Pixels640X480)

Exposure Time (Sec) \ Recording Speed (pps)	100	250	500	1000
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	×	×	×	×

Note 1) The exposure time cannot be set longer than 1/frame rate.

Note 2) ○ refers to shutter speeds that can be set, × and △ refer to shutter speeds that cannot be preset.

Note 3) △ refers to a custom shutter that can be set.

Note 4) * refers to an open shutter. (= 1/frame rate-54μs)

Note 5) If there is a shutter speed that cannot be set by changing the frame rate or the number of pixels, the shutter will be open or the minimum exposure time will be used. If set to an open shutter or the minimum exposure time, these settings will be retained even if the frame rate or the number of pixels is changed.

Note 6) Designate the frame rate priority or frame size priority and set.

Note 7) There may be times when settings are not possible even if the shutter exposure time settings are displayed on the menu due to the recording conditions or the combination of varying types of cameras (P2-Cam、S2-Cam、HR-Cam、C-Cam、μ-Cam) . In this case, the shutter exposure times return to the settings before the changes were made

3) Custom Shutter Exposure Times

56~9946 microseconds, 1 microsecond increments

Possible Settings and Intervals for Exposure Times

Recording Speed (pps)	Pixels (HxV)	Setting (us)		Setting Intervals (us) Note 2)
		Maximum	Minimum	
100	640x480	9946	56	1
250	640x480	3946	56	1
500	640x480	1946	56	1
1,000	640x480	946	56	1

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

Note 2) Shutter can be set by 1us step however, it performs by 8-9us steps only due to camera specifications

7.1.4.6 Camera Cable Length

With the RX-5 pencil, all of the camera cable lengths must be identical but with the GX-5, the cable length for each camera head can be different.

If using an extension cable and using together with a BB1 UNIT with a maximum length of about 7m, the maximum length can be extended to about 16m.

Note) u-Cam can be extended up to 7m at maximum. Be sure to connect with 3m HR-Cam cables for extension

Example 1) HR Camera cable 3m + extension cable 4m = 7m

Example 2) HR Camera cable 3m + extension cable 4m + BB1 UNIT 5m + extension cable 4m = 16m

Note) One extension cable can be used between the camera and the BB1 UNIT.

7.1.4.7 Lens Mount

M10.5 P0.5

7.1.4.8 Burst Recording with μ -Cam

When recording with μ -Cam in Burst recording mode, trigger frame shall be shifted by 1 frame.

It starts recording a frame before the frame triggered (start of trigger) and finish recording a frame before the frame triggered (end of trigger)

7.1.5 Compatibility with the Previous Series

The GX-5 uses the shutter exposure start timing as the standard. When the MEMRECAM ci and fx perform exposure end timing or other expressions of the shutter, the image sensor read start timing becomes the standard.

Therefore, there is a lag in the exposure time when there is a multi camera complete synchronization system with a combination of the previous camera series and the GX-5.

Since the GX-5 has a mode that is compatible with the previous series of cameras, this must be set (set the Exposure Timing to K3 compat).

With only GX-5, or with multi camera synchronization systems with cameras from other companies that use exposure start timing as the standard, set the exposure time (EXP TIME) to GX native. Also set the Exposure Timing to GX native when performing EST recording.

Note 1) With a combination of MEMRECAM fx-K4/K5 and GX-5, set the K4/K5 exposure time to standard and either set the GX-5 exposure time to K4 compat or set the K4/K5 exposure time to legacy and the GX-5 exposure time to K3 compat.

Note 2) With a multi camera synchronization system, if the fx series cameras other than the MEMRECAM ci series and fx-K4/K5 have open shutters at less than 1000pps, there will be a lag in the exposure time so do not use with the shutter OPEN.

7.1.6 Precautions during C-Cam / μ -Cam EST Use

- The frame rate must be set to at least three times the peak frequency (inverse of the shortest cycle) of the external exposure start signal.
- If the above condition is not met, the image will be over- or under-exposed.
- It is possible to use multiple C-Cams or μ -Cams but it is not possible to combine them with other types of cameras, such as the P2-Cam and such.

Refer to 【APPENDIX B Exposure Start Signals (EST) and Event Signals B3.Timing Controls】 for details.

7.2 Recorder

7.2.1 Memory

- 1) Installed Memory It is possible to select it from 2/4/8GB.

Variable-length memory record allocation (VRMS : Variable Recording Memory Sharing)

The recording time can be extended by decreasing the number of cameras.

- 2) With memory segments

The memory can be used by dividing. A separate scene of each segment can be recorded by dividing the image memory into two or more segments. The recording image of two or more scenes is maintained, and it is possible to download it later collectively. The automatic segment switch function is provided.

< P2-Cam, S2-Cam, C-Cam, μ -Cam use >

Segment Size : It becomes the following corresponding to the memory capacity.

Number of camera head	Installed Memory	Segment size and number of segments						
		1	2	4	8	16	32	64
1	2GB	2.0GB	1.0GB	524MB	262MB	131MB	65MB	-
	4GB	4.2GB	2.1GB	1.0GB	530MB	265MB	132MB	66MB
	8GB	8.5GB	4.2GB	2.1GB	1.0GB	533MB	266MB	133MB
2	2GB	1.0GB	524MB	262MB	131MB	65MB	-	-
	4GB	2.1GB	1.0GB	530MB	265MB	132MB	66MB	-
	8GB	4.2GB	2.1GB	1.0GB	533MB	266MB	133MB	-
3	2GB	699MB	349MB	174MB	87MB	-	-	-
	4GB	1.4GB	707MB	353MB	176MB	88MB	-	-
	8GB	2.8GB	1.4GB	711MB	355MB	177MB	-	-
4	2GB	524MB	262MB	131MB	65MB	-	-	-
	4GB	1.0GB	530MB	265MB	132MB	66MB	-	-
	8GB	2.1GB	1.0GB	533MB	266MB	133MB	-	-
5	2GB	419MB	209MB	104MB	-	-	-	-
	4GB	849MB	424MB	212MB	106MB	-	-	-
	8GB	1.7GB	854MB	427MB	213MB	-	-	-
6	2GB	349MB	174MB	87MB	-	-	-	-
	4GB	707MB	353MB	176MB	88MB	-	-	-
	8GB	1.4GB	711MB	355MB	177MB	-	-	-
7	2GB	299MB	149MB	74MB	-	-	-	-
	4GB	606MB	303MB	151MB	75MB	-	-	-
	8GB	1.2GB	610MB	305MB	152MB	-	-	-
8	2GB	262MB	131MB	65MB	-	-	-	-
	4GB	530MB	265MB	132MB	66MB	-	-	-
	8GB	1.0GB	533MB	266MB	133MB	-	-	-

<HR-Cam use >

Number of camera head	Installed Memory	Camera type	Segment size and number of segments						
			1	2	4	8	16	32	64
HR-Cam x1	2GB	HR-Cam	2.0GB	1.0GB	524MB	262MB	-	-	-
	4GB	HR-Cam	4.2GB	2.1GB	1.0GB	530MB	265MB	-	-
	8GB	HR-Cam	8.5GB	4.2GB	2.1GB	1.0GB	533MB	266MB	-
HR-Cam x1	2GB	HR-Cam	1.0GB	524MB	262MB	-	-	-	-
	4GB	HR-Cam	2.1GB	1.0GB	530MB	265MB	-	-	-
	8GB	HR-Cam	4.2GB	2.1GB	1.0GB	533MB	266MB	-	-
HR-Cam x1 P2-Cam x1	2GB	HR-Cam	1.3GB	698MB	349MB	-	-	-	-
		P2-Cam	349MB	174MB	87MB	-	-	-	-
	4GB	HR-Cam	2.8GB	1.4GB	707MB	353MB	-	-	-
		P2-Cam	707MB	353MB	176MB	88MB	-	-	-
	8GB	HR-Cam	5.6GB	2.8GB	1.4GB	711MB	355MB	-	-
		P2-Cam	1.4GB	711MB	355MB	177MB	88MB	-	-
HR-Cam x1 P2-Cam x2	2GB	HR-Cam	1.3GB	698MB	349MB	-	-	-	-
		P2-Cam	349MB	174MB	87MB	-	-	-	-
	4GB	HR-Cam	2.8GB	1.4GB	707MB	353MB	-	-	-
		P2-Cam	707MB	353MB	176MB	88MB	-	-	-
	8GB	HR-Cam	5.6GB	2.8GB	1.4GB	711MB	355MB	-	-
		P2-Cam	1.4GB	711MB	355MB	177MB	88MB	-	-
HR-Cam x1 P2-Cam x3	2GB	HR-Cam	1.0GB	524MB	262MB	-	-	-	-
		P2-Cam	252MB	131MB	65MB	-	-	-	-
	4GB	HR-Cam	2.1GB	1.0GB	530MB	265MB	-	-	-
		P2-Cam	530MB	265MB	132MB	66MB	-	-	-
	8GB	HR-Cam	4.2GB	2.1GB	1.0GB	533MB	266MB	-	-
		P2-Cam	1.0GB	533MB	266MB	133MB	66MB	-	-
HR-Cam x1 P2-Cam x4	2GB	HR-Cam	1.0GB	524MB	262MB	-	-	-	-
		P2-Cam	262MB	131MB	65MB	-	-	-	-
	4GB	HR-Cam	2.1GB	1.0GB	530MB	265MB	-	-	-
		P2-Cam	530MB	265MB	132MB	66MB	-	-	-
	8GB	HR-Cam	4.2GB	2.1GB	1.0GB	533MB	-	-	-
		P2-Cam	1.0GB	533MB	266MB	133MB	-	-	-

The memory segment recording time is the time to split the recording time into separate memory sections by the number of camera heads x number of segments. During HR-Cam use, the capacity for the P2-Cam/S2-Cam/C-Cam/ μ -Cam 4 is that of the HR-Cam1. In the table, the P2-Cam is the same as when switched with the S2-Cam or the C-Cam or the μ -Cam. With 5~8 camera heads or a combination of HR-Cam x 2, HR-Cam and P2-Cam, the DRP functions only as the 8ch model.

The recording time in the memory segment reaches the value in which the recording time in each memory capacity is divided by the number of camera head \times number of segments.

7.2.2 Recording Bit Length

The number of recording bits a pixel can be selected from 8/10 bit image.

- **10 bit** It is the same as a previous fx series. It becomes a standard image quality.
- **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

7.2.3.1 P2-Cam, S2-Cam, C-Cam, μ-Cam

The next table shows the recording times by combining the possible recording speeds with preset settings and the frame sizes. The condition in the following table is a value when 10 bits in the recording bit length and 2 camera head connecting it. "×" indicates that settings cannot be combined.

Locations with ※ cannot be selected with C-Cam.

μ-Cam is recorded regardless of frame size in 640x480. In μ-Cam, it is chosen only "※※".

Recording Times for Preset Settings (sec) (Installed Memory 2GB)

Frame Size [pixel] Recording Speed [pps]	640x480	576x432	512x384	448x336	384x288	320x240	256x192	192x144	128x96	64x48	32x16
50	54.6	67.42	85.32	111.44	151.68	218.36	341.04	605.72	1358.98	5352.84	29143.32
60	45.5	56.18	71.1	92.87	126.4	181.97	284.2	504.77	1132.48	4460.7	24286.1
100	27.3※※	33.71	42.66	55.72	75.84	109.18	170.52	302.86	679.49	2676.42	14571.66
250	10.92※※	13.48	17.06	22.29	30.34	43.67	68.21	121.14	271.8	1070.57	5828.66
500	5.46※※	6.74	8.53	11.14	15.17	21.84	34.1	60.57	135.9	535.28	2914.33
750	3.64	4.49	5.69	7.43	10.11	14.56	22.74	40.38	90.6	356.86	1942.89
1000	2.73※※	3.37	4.27	5.57	7.58	10.92	17.05	30.29	67.95	267.64	1457.17
1500	×	×	2.84	3.71	5.06	7.28	11.37	20.19	45.3	178.43	971.44
2000	×	×	×	2.79	3.79	5.46	8.53	15.14	33.97	133.82	728.58
2500	×	×	×	×	3.03	4.37	6.82	12.11	27.18	107.06	582.87
3000	×	×	×	×	×	3.64	5.68	10.1	22.65	89.21	485.72
4000	×	×	×	×	×	2.73	4.26	7.57	16.99	66.91	364.29
5000	×	×	×	×	×	×	3.41	6.06	13.59	53.53	291.43
6000	×	×	×	×	×	×	2.84 ※	5.05	11.32	44.61	242.86
8000	×	×	×	×	×	×	×	3.79	8.49	33.46	182.15
10000	×	×	×	×	×	×	×	3.03 ※	6.79	26.76	145.72
15000	×	×	×	×	×	×	×	×	4.53 ※	17.84	97.14
20000	×	×	×	×	×	×	×	×	×	13.38 ※	72.86
25000	×	×	×	×	×	×	×	×	×	10.71 ※	58.29
30000	×	×	×	×	×	×	×	×	×	8.92 ※	48.57 ※
40000	×	×	×	×	×	×	×	×	×	6.69 ※	36.43 ※
50000	×	×	×	×	×	×	×	×	×	5.35 ※	29.14 ※
60000	×	×	×	×	×	×	×	×	×	×	24.29 ※
80000	×	×	×	×	×	×	×	×	×	×	18.21 ※
100000	×	×	×	×	×	×	×	×	×	×	14.57 ※

Recording Times for Preset Settings (sec) (Installed Memory 4 GB)

Frame Size Recording Speed [pps]	640x480	576x432	512x384	448x336	384x288	320x240	256x192	192x144	128x96	64x48	32x16
50	110.52	136.44	172.68	225.52	306.92	441.88	690.12	1225.66	2749.84	10831.1	58969.48
60	92.1	113.7	143.9	187.93	255.77	368.23	575.1	1021.38	2291.53	9025.92	49141.23
100	55.26 ※※	68.22	86.34	112.76	153.46	220.94	345.06	612.83	1374.92	5415.55	29484.74
250	22.1 ※※	27.29	34.54	45.1	61.38	88.38	138.02	245.13	549.97	2166.22	11793.9
500	11.05 ※※	13.64	17.27	22.55	30.69	44.19	69.01	122.57	274.98	1083.11	5896.95
750	7.37	9.1	11.51	15.03	20.46	29.46	46.01	81.71	183.32	722.07	3931.3
1000	5.53 ※※	6.82	8.63	11.28	15.35	22.09	34.51	61.28	137.49	541.56	2948.47
1500	x	x	5.76	7.52	10.23	14.73	23	40.86	91.66	361.04	1965.65
2000	x	x	x	5.64	7.67	11.05	17.25	30.64	68.75	270.78	1474.24
2500	x	x	x	x	6.14	8.84	13.8	24.51	55	216.62	1179.39
3000	x	x	x	x	x	7.36	11.5	20.43	45.83	180.52	982.82
4000	x	x	x	x	x	5.52	8.63	15.32	34.37	135.39	737.12
5000	x	x	x	x	x	x	6.9	12.26	27.5	108.31	589.69
6000	x	x	x	x	x	x	5.75 ※	10.21	22.92	90.26	491.41
8000	x	x	x	x	x	x	x	7.66	17.19	67.69	368.56
10000	x	x	x	x	x	x	x	6.13 ※	13.75	54.16	294.85
15000	x	x	x	x	x	x	x	x	9.17 ※	36.1	196.56
20000	x	x	x	x	x	x	x	x	x	27.08 ※	147.42
25000	x	x	x	x	x	x	x	x	x	21.66 ※	117.94
30000	x	x	x	x	x	x	x	x	x	18.05 ※	98.28 ※
40000	x	x	x	x	x	x	x	x	x	13.54 ※	73.71 ※
50000	x	x	x	x	x	x	x	x	x	10.83 ※	58.97 ※
60000	x	x	x	x	x	x	x	x	x	x	49.14 ※
80000	x	x	x	x	x	x	x	x	x	x	36.86 ※
100000	x	x	x	x	x	x	x	x	x	x	29.48 ※

Recording Times for Preset Settings (sec) (Installed Memory 8 GB)

Frame Size Recording Speed [pps]	640x480	576x432	512x384	448x336	384x288	320x240	256x192	192x144	128x96	64x48	32x16
50	222.34	274.48	347.38	453.68	617.46	888.9	1388.28	2465.56	5531.56	21787.66	118621.8
60	185.28	228.73	289.48	378.07	514.55	740.75	1156.9	2054.63	4609.63	18156.38	98851.5
100	111.17 ※※	137.24	173.69	226.84	308.73	444.45	694.14	1232.78	2765.78	10893.83	59310.9
250	44.47 ※※	54.9	69.48	90.74	123.49	177.78	277.66	493.11	1106.31	4357.53	23724.36
500	22.23 ※※	27.45	34.74	45.37	61.75	88.89	138.83	246.56	553.16	2178.77	11862.18
750	14.82	18.3	23.16	30.25	41.16	59.26	92.55	164.37	368.77	1452.51	7908.12
1000	11.12 ※※	13.72	17.37	22.68	30.87	44.45	69.41	123.28	276.58	1089.38	5931.09
1500	x	x	11.58	15.12	20.58	29.63	46.28	82.19	184.39	726.26	3954.06
2000	x	x	x	11.34	15.44	22.22	34.71	61.64	138.29	544.69	2965.55
2500	x	x	x	x	12.35	17.78	27.77	49.31	110.63	435.75	2372.44
3000	x	x	x	x	x	14.82	23.14	41.09	92.19	363.13	1977.03
4000	x	x	x	x	x	11.11	17.35	30.82	69.14	272.35	1482.77
5000	x	x	x	x	x	x	13.88	24.66	55.32	217.88	1186.22
6000	x	x	x	x	x	x	11.57 ※	20.55	46.1	181.56	988.52
8000	x	x	x	x	x	x	x	15.41	34.57	136.17	741.39
10000	x	x	x	x	x	x	x	12.33 ※	27.66	108.94	593.11
15000	x	x	x	x	x	x	x	x	18.44 ※	72.63	395.41
20000	x	x	x	x	x	x	x	x	x	54.47 ※	296.55
25000	x	x	x	x	x	x	x	x	x	43.58 ※	237.24
30000	x	x	x	x	x	x	x	x	x	36.31 ※	197.7 ※
40000	x	x	x	x	x	x	x	x	x	27.23 ※	148.28 ※
50000	x	x	x	x	x	x	x	x	x	21.79 ※	118.62 ※
60000	x	x	x	x	x	x	x	x	x	x	98.85 ※
80000	x	x	x	x	x	x	x	x	x	x	74.14 ※
100000	x	x	x	x	x	x	x	x	x	x	59.31 ※

7.2.3.2 HR-Cam

The following table shows the preset settings for frame rates and the recording times for the various frame sizes. The conditions for the following table are the values for a recording bit length of 10 bits and the HR-Cam1 connection.

× is a combination that cannot be set.

Recording Times for Preset Settings (sec) (Installed Memory 2GB)

フレームサイズ 録画速度 [pixel] [pps]	1280x960	1152x864	1024x768	896x672	768x576	640x480	512x384	384x288	256x192	128x96	64x32
50	27.31	33.72	42.67	55.73	75.85	109.19	170.53	302.87	679.5	2676.43	14571.67
60	22.76	28.1	35.56	46.44	63.2	90.99	142.11	252.39	566.25	2230.35	12143.06
100	13.65	16.86	21.33	27.86	37.92	54.59	85.26	151.43	339.75	1338.21	7285.83
250	5.463	6.744	8.535	11.14	15.17	21.83	34.1	60.57	135.9	535.28	2914.33
500	2.731	3.372	4.267	5.573	7.585	10.91	17.05	30.28	67.95	267.64	1457.16
750	1.821	2.248	2.845	3.715	5.056	7.279	11.36	20.19	45.3	178.42	971.44
1000	1.365	1.686	2.133	2.786	3.792	5.459	8.526	15.14	33.97	133.82	728.58
1500	×	×	1.422	1.857	2.528	3.639	5.684	10.09	22.65	89.21	485.72
2000	×	×	×	1.393	1.896	2.729	4.263	7.571	16.98	66.91	364.29
2500	×	×	×	×	1.517	2.183	3.41	6.057	13.59	53.52	291.43
3000	×	×	×	×	×	1.819	2.842	5.047	11.32	44.6	242.86
4000	×	×	×	×	×	1.364	2.131	3.785	8.493	33.45	182.14
5000	×	×	×	×	×	×	1.705	3.028	6.795	26.76	145.71
6000	×	×	×	×	×	×	1.421	2.523	5.662	22.3	121.43
8000	×	×	×	×	×	×	×	1.892	4.246	16.72	91.07
10000	×	×	×	×	×	×	×	1.514	3.397	13.38	72.85
15000	×	×	×	×	×	×	×	×	2.265	8.921	48.57
20000	×	×	×	×	×	×	×	×	×	6.691	36.42
25000	×	×	×	×	×	×	×	×	×	5.352	29.14
30000	×	×	×	×	×	×	×	×	×	4.46	24.28
40000	×	×	×	×	×	×	×	×	×	3.345	18.21
50000	×	×	×	×	×	×	×	×	×	2.676	14.57
60000	×	×	×	×	×	×	×	×	×	×	12.14
80000	×	×	×	×	×	×	×	×	×	×	9.107
100000	×	×	×	×	×	×	×	×	×	×	7.285

Recording Times for Preset Settings (sec) (Installed Memory 4GB)

フレームサイズ 録画速度 [pixel] [pps]	1280x960	1152x864	1024x768	896x672	768x576	640x480	512x384	384x288	256x192	128x96	64x32
50	55.27	68.23	86.35	112.77	153.47	220.95	345.07	612.84	1374.93	5415.56	29484.75
60	46.06	56.86	71.96	93.98	127.89	184.12	287.56	510.7	1145.78	4512.97	24570.63
100	27.63	34.11	43.17	56.38	76.73	110.47	172.53	306.42	687.46	2707.78	14742.37
250	11.05	13.64	17.27	22.55	30.69	44.19	69.01	122.56	274.98	1083.11	5896.95
500	5.527	6.823	8.635	11.27	15.34	22.09	34.5	61.28	137.49	541.55	2948.47
750	3.684	4.548	5.756	7.518	10.23	14.73	23	40.85	91.66	361.03	1965.65
1000	2.763	3.411	4.317	5.638	7.673	11.04	17.25	30.64	68.74	270.77	1474.23
1500	×	×	2.878	3.759	5.115	7.365	11.5	20.42	45.83	180.51	982.82
2000	×	×	×	2.819	3.836	5.523	8.626	15.32	34.37	135.38	737.11
2500	×	×	×	×	3.069	4.419	6.901	12.25	27.49	108.31	589.69
3000	×	×	×	×	×	3.682	5.751	10.21	22.91	90.25	491.41
4000	×	×	×	×	×	2.761	4.313	7.66	17.18	67.69	368.55
5000	×	×	×	×	×	×	3.45	6.128	13.74	54.15	294.84
6000	×	×	×	×	×	×	2.875	5.107	11.45	45.12	245.7
8000	×	×	×	×	×	×	×	3.83	8.593	33.84	184.27
10000	×	×	×	×	×	×	×	3.064	6.874	27.07	147.42
15000	×	×	×	×	×	×	×	×	4.583	18.05	98.28
20000	×	×	×	×	×	×	×	×	×	13.53	73.71
25000	×	×	×	×	×	×	×	×	×	10.83	58.96
30000	×	×	×	×	×	×	×	×	×	9.025	49.14
40000	×	×	×	×	×	×	×	×	×	6.769	36.85
50000	×	×	×	×	×	×	×	×	×	5.415	29.48
60000	×	×	×	×	×	×	×	×	×	×	24.57
80000	×	×	×	×	×	×	×	×	×	×	18.42
100000	×	×	×	×	×	×	×	×	×	×	14.74

Recording Times for Preset Settings (sec) (Installed Memory 8GB)

フレームサイズ 録画速度 [pixel] [pps]	1280x960	1152x864	1024x768	896x672	768x576	640x480	512x384	384x288	256x192	128x96	64x32
50	111.18	137.25	173.7	226.85	308.73	444.46	694.14	1232.79	2765.79	10893.84	59310.91
60	92.65	114.38	144.75	189.04	257.27	370.38	578.45	1027.32	2304.82	9078.2	49425.76
100	55.59	68.62	86.85	113.42	154.36	222.23	347.07	616.39	1382.89	5446.92	29655.45
250	22.23	27.45	34.74	45.37	61.74	88.89	138.82	246.55	553.15	2178.76	11862.18
500	11.11	13.72	17.37	22.68	30.87	44.44	69.41	123.27	276.57	1089.38	5931.09
750	7.412	9.15	11.58	15.12	20.58	29.63	46.27	82.18	184.38	726.25	3954.06
1000	5.559	6.862	8.685	11.34	15.43	22.22	34.7	61.63	138.28	544.69	2965.54
1500	×	×	5.79	7.561	10.29	14.81	23.13	41.09	92.19	363.12	1977.03
2000	×	×	×	5.671	7.718	11.11	17.35	30.81	69.14	272.34	1482.77
2500	×	×	×	×	6.174	8.889	13.88	24.65	55.31	217.87	1186.21
3000	×	×	×	×	×	7.407	11.56	20.54	46.09	181.56	988.51
4000	×	×	×	×	×	5.555	8.676	15.4	34.57	136.17	741.38
5000	×	×	×	×	×	×	6.941	12.32	27.65	108.93	593.1
6000	×	×	×	×	×	×	5.784	10.27	23.04	90.78	494.25
8000	×	×	×	×	×	×	×	7.704	17.28	68.08	370.69
10000	×	×	×	×	×	×	×	6.163	13.82	54.46	296.55
15000	×	×	×	×	×	×	×	×	9.219	36.31	197.7
20000	×	×	×	×	×	×	×	×	×	27.23	148.27
25000	×	×	×	×	×	×	×	×	×	21.78	118.62
30000	×	×	×	×	×	×	×	×	×	18.15	98.85
40000	×	×	×	×	×	×	×	×	×	13.61	74.13
50000	×	×	×	×	×	×	×	×	×	10.89	59.31
60000	×	×	×	×	×	×	×	×	×	×	49.42
80000	×	×	×	×	×	×	×	×	×	×	37.06
100000	×	×	×	×	×	×	×	×	×	×	29.65

7.2.4 Live Image Display

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

- | | | |
|-----|------|---|
| 1) | NTSC | Update rate : 30 frames/sec (camera head one display) |
| 2) | PAL | Update rate : 25 frames/sec (camera head one display) |

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.

Note 4) When the event trigger is selected, and the trigger timing is set to less than 0% of CUSTOM, the event cannot be recorded.

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) | |
| | ① | Frame exposure center time (day, hour, minute, second, μ sec units) |
| | ② | Trigger time (in day, hour, min, sec and usec units) |
| | ③ | EVENT |
| | ④ | IRIG Lock |

The time stamp can be turned ON/OFF.

7.3 Video Converter

It is a video output for the viewfinder. The image of one camera is switched and displayed.

- | | | |
|--|---|---|
| 1) | Output Signal | NTSC / PAL method analog signal, 75 Ω , 1 V(p-p) |
| | Image update rate | 30 frame/sec (NTSC), 25frame/sec (PAL) |
| | Display area | 640x480(NTSC), 768x576(PAL) |
| 2) | Gradation | Y, Cb, Cr each 8 bit (internal digital final stage) |
| 3) | Image Quality Settings | |
| | Gain | LOW, NORMAL, HIGH |
| | White balance | AUTO, 3100K, 5000K, 9000K, REG |
| | Enhance | OFF, LOW, NORMAL, HIGH |
| | Gamma | OFF, LOW, NORMAL |
| | Chroma | 0%, 50%, 100%, 150%, 200% |
| | Knee | OFF, ON |
| | RGB Matrix | OFF, ON |
| | Luminance | NORMAL, LINEAR, CUSTOM |
| 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. |
| | | With the multi-color view, the partitioned region is displayed on the entire screen. |
| 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). With only one camera displayed, the mark can be selected as black/white. |
| 7) | Playback display | |
| | Playback speed (NTSC) | Forward, 1~1920 frames/sec, both forward and reverse |
| | Playback speed (PAL) | Forward, 1~2000 frames/sec, both forward and reverse |
| | Frame jump | Trigger frame, recording start frame, recording end frame |
| | Playback mode | Single playback (PLAY mode), loop playback (LOOP mode) |
| | Playback range settings | Playback start frame and playback end frame settings |
| Note) If the playback rate is more than 30 frames per second, the image is skip displayed (skips frames in the middle). However, if recording to VTR and such and playing back at a rate of 30 frames per second or less, images that have been completely recorded can be saved. (With PAL, the number 30 becomes 25) | | |
| The frame number corresponds to the image. Still images cannot be double exposed. | | |
| 8) | Video output control | Video output can be set to ON/OFF |
| 9) | Camera switching | When two or more camera heads are connected, it is possible to select it. |

7.4 System Controls

7.4.1 Operation by the main body Switch

- POWER Switch : Rotary type (OFF、REMOTE、ON) (8ch DRP)

Note) When REMOTE is set, the power supply of DRP, J-PAD3 (Option), and LCD FINDE (Option) is turned on and off simultaneously with the power supply of GX-HUB/GX-HUBi.
The power supply is turned on when it is not connected to GX-HUB/GX-HUBi.

7.4.2 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, elevated sensor temperature detected, trigger abnormal detection or setting abnormal detection

2) CAMERA MODE LED (CM)

Orange	REC	REC mode (Camera image output, saving in the camera image memory after trigger detection)
Blue	STOP	STOP mode(Memory image output. Immediately after startup, either the playback mode or the transmission mode)
White	VIEW	VIEW mode(Camera image output, memory contents retained after save completed)
Magenta	ARM	ARM mode (camera image output, memory contents discarded after save completed and camera image being saved in memory)
Not lit	OFF	Power OFF, or starting up
Flashing	EST	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
Not lit	Network not connected or power OFF

5) USB LED (UB) :

Lit green	Device connected
Not lit	Device not connected or power OFF

7.4.3 Display of camera head connection state with port LED

The state of the camera head connection is displayed with LED of each camera port.

Display color state of lighting	It is possible to take a picture	state of camera head connection	State of port(setting)
Not lit	–	Before startup	–
Flashing green(quickly)	–	While startup	–
Flashing yellow(slowly)	△	Usable	Invalid
Flashing yellow(quickly)	×	Not connected	Effective
Lit yellow	×	Not connected	Invalid
Lit green	○	Usable	Effective
Flashing red(quickly)	×	Unusable	Effective
Lit red	×	Unusable	Invalid

If the light corresponding to “recording possible” is “△” and the camera configuration is set, it will be possible to use the connected camera.



7.4.4 Video Output On Screen Display

- | | | |
|-----|-----------------|---|
| 1) | Mode display | LLIGHT (LOW LIGHT), STOP, VIEW, ARM, REC, FAIL |
| 2) | Recording speed | 50~100,000 (pps units in integers), EST |
| 3) | Shutter | 1/100~1/333,333, 1~9996 (micro units in integers), OPEN |
| 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
Inconsistent camera configuration
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
Image memory protection
Camera FPN data error |

7.4.5 Remote Control J-PAD3



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

Bold indicates factory settings.

- 1) Status Display 1
- Displayed in the VIEW, ARM, REC and LOW LIGHT modes other than the menu mode. When it is selected excluding "TIME", use the arrows   to select port, and it switches the camera that the video display selected.
- | | |
|------------|---|
| • 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 |
| • SEGMENT | Display segment number |

- CAMERA Camera head number 1~8 , **** , ALL
**** is the 4 partition display with a multi-camera view (Example 12--)
ALL is the 9 partition display with a multi-camera view

2) Status Display 2

Displayed in the STOP, PLAY and LOOP modes other than the menu mode. When it is selected excluding "TIME", use the arrows   to select port, and it switches the camera that the video display selected.

- MODE Display mode
- FRAME Display frame counter
- TIME Display frame time
- PLAY Display playback speed
- FRM RATE Display recording speed
- FRM SIZE Display frame size (valid pixels)
- SHUTTER Display shutter
- TRIGGER Display trigger
- ID Display ID number
- SCENE Display scene number
- SEGMENT Display segment number
- CAMERA Camera head number 1~8 , **** , ALL
**** is the 4 partition display with a multi-camera view (Example 12--)
ALL is the 9 partition display with a multi-camera view
- 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】
(**640x480 (P2-Cam, S2-Cam, C-Cam, μ-Cam), 1280x1024 (HR-Cam)**)
- CUSTOM F Custom recording speed/frame size setting menu
 - PRIORITY Priority settings, RATE, SIZE
 - FRM RATE Recording speed settings
 - FRM SIZE Frame size settings
- SHUTTER Shutter exposure time settings, refer to the 【7.1 imager】 (**OPEN**)
- LOWLIGHT Low light mode settings, **100**, 250, 500, 1000, CUSTOM
- GAIN Gain settings, LOW, NORMAL, HIGH
- WHT BAL White balance settings, AUTO, 3100, 5000, 9000, REG, SET
- ENHANCE Enhance settings, OFF, LOW, NORMAL, HIGH
- GAMMA Gamma settings, OFF, LOW, NORMAL
- CHROMA Chroma settings, 0, 50, 100, **150**, 200
- KNEE Knee settings, OFF, **ON**
- RGB COR. RGB Matrix Settings, OFF, ON
- LUMINANC Luminance characteristic settings, NORMAL, LINEAR, CUSTOM
- DEPTH Bits saved settings, 8, **10**
- ZOOM Zoom display settings, FIT1, FIT2, 1/2, x1, x2, x4
- SCROLL XY coordinate settings and display **0 0** (center of the screen) set using arrows. Trigger button targets the center of the screen.

4) General Setup Menu (TOP MENU)

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

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

4.1) Memory Segment Menu (MEM SEG)

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

4.2) System Menu (SYS MENU)

- ID ID number settings, **0**~127
- DATETIME Date and time settings, year, month, day, hour, minute, second
- OSD DISP Video OSD display settings, OFF, FRAME, **ALL**
- OSD MODE Video OSD display setting in camera mode, **ALWAYS**, STOP
- OSD TIME Trigger time display settings, **TRIG**, CRNT
- CAFM DIS Video image center mark settings, **OFF**, WHT, BLK
- FRM DISP Frame number display settings, frame number (**FRAME**), time elapsed from trigger input (TIME), absolute time (ABS.TIME), memory%
- FRM TIME Frame time standard settings, trigger (**TRIGGER**), exposure center (EXPOSURE)
- REL TIME Relative time standard setting **FRAME**, TRIG
- TIMSTAMP Time stamp record settings, **OFF**, ON
- EXP TIME Exposure time settings
GX native Internal standard time = Start exposure
K3 compat Internal standard time = End exposure
K4 compat Internal standard time = End exposure (K4/K5)
- SYNC TIME Synchronized time selection, **ASYNC**(internal camera), GX-HUB, IRIG
- SYNC SEL Synchronized signal selection, **INT**(internal camera), 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 ends recording at the final segment, LOOP continues recording by returning to the first segment.
AUTOVIEW settings are not valid with the recording method performing auto segment switching.

• WARNING	Warning settings menu																										
BATTERY	Low battery warning, OFF , ON																										
RTC BATT	RTC battery warning, OFF , ON																										
FRM RATE	Abnormal recording speed warning, OFF , ON																										
IRQ	Monitor abnormal camera interruption, OFF , ON																										
BLK BAL	Inconsistent black balance warning, OFF, ON																										
• TRIG SET	Trigger settings menu																										
TRIG SEL	Trigger signal selection, TRIG1 (J1 connector), TRIG2(J3 connector)																										
REC MODE	<table> <tr> <td>NORMAL</td><td>Normal recording</td></tr> <tr> <td>NORMAL(A)</td><td>Normal recording (A)</td></tr> <tr> <td>NORMAL(L)</td><td>Normal recording (L)</td></tr> <tr> <td>EVENT</td><td>Event recording</td></tr> <tr> <td>EVENT(A)</td><td>Event recording (A)</td></tr> <tr> <td>EVENT(L)</td><td>Event recording (L)</td></tr> <tr> <td>BURST</td><td>Burst recording</td></tr> <tr> <td>BURST(A)</td><td>Burst recording (A)</td></tr> <tr> <td>BURST(L)</td><td>Burst recording (L)</td></tr> <tr> <td>MULTI(A)</td><td>Multi trigger recording (All blocks)</td></tr> <tr> <td>MULTI(C)</td><td>Multi trigger recording (continuous)</td></tr> <tr> <td>MULTIS(A)</td><td>Multi trigger recording (All blocks)(A)</td></tr> <tr> <td>MULTIS(L)</td><td>Multi trigger recording (All blocks)(L)</td></tr> </table> <p>(A) is short for AUTO, and ends switch auto segment • save all segments, record all blocks. (L) is short for LOOP and auto switches and continues segments on the memory segments. STOP command is the only way to stop the LOOP. (C) is short for CONTINUOUS, where the memory block in the memory segment is overwritten (All) ends recording of all memory blocks in the memory segment.</p> <p>Recording methods with (A) (L) (C) take priority with the AUTO VIEW function.</p>	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)
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)																										
BLOCKS	Multi trigger block settings, 2~16																										
• 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)																										
TRIGFLT	Trigger filter settings, + 20.0 , 0.0~6553.5 (in usec units)																										
EST FLT	EST filter settings, 0.0 ~6553.5 (in usec units)																										
• SYS SET	System settings menu																										
SEG SIZE	Memory segment settings, 2GB : 1 ~16 4GB : 1 ~32 8GB : 1 ~64																										
CAMCFG	Execution of camera configuration settings																										
REBOOT	Reboot system																										
• 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
CAMERA	Port number display while video is displayed
CAMTYPE	Kind of camera head under connection, P-CAM, HR-Cam
Note) Displayed as P-CAM even if S2-Cam、C-Cam、μ-Cam are used.	

4.3) Save Menu (SAVE MENU)

• MCFF	Save in MCFF format, Show saved file name after saved
• CAMERA	Display camera number that has been selected.
• 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

7.4.6 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
8ch DRP
Type Nickel cadmium: D X 6 piece
Nominal Capacity 2000 mAh
Nominal Voltage 7.2V
Life 1 year

4ch DRP
Type Nickel cadmium: AA X 6 piece
Nominal Capacity 600 mAh
Nominal Voltage 7.2V
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
8ch DRP
2GB 1 hour
4GB 1 hour
8GB 1 hour

4ch DRP
2GB 1 hour
4GB 1 hour
8GB 1 hour
- 3) Backup Start Conditions
After recording (ARM) start, if the DC input voltage to the MEMRECAM main unit is 19.0V or less.
- 4) Charging
Time 8ch DRP Approximately 10 hours (from completely dead battery to full charge)
4ch DRP 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 front panel of the DRP.

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.

Please contact the shop or our company about the battery replacement.

7.5 Input/Output Connector

7.5.1 J1 Connector

- 1) Connector

ID color	Yellow
Name	TRIG&STATUS
Connector name	LEMO EGG.2B.310
Plug name	LEMO FGG.2B.310
- 2) EST1 Input

Signal level	TTL level, 5V pull up resistance 4700Ω, insulation L level : - 0.5VDC (minimum applied voltage) ~0.8VDC H level : 2VDC~5.5VDC (maximum applied voltage)
Function	Exposure starts H→L, photographs one image. Synchronization delay 1.5 μ sec or less. Reverse polarity function.
Refer to APPENDIX B for details.	
- 3) 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.	
- 4) 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.	
- 5) 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.	
- 6) Input Power (**Only 4ch DRP**)

Power voltage	DC20—32V
Input power	DC power (AC adapter) or the included battery
Power consumption	Approximately 66W (ARM mode, DC24V, when connecte P2-Cam four, 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 【1.2.3 3】)

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
Signal level | NTSC / PAL
1V(p-p), 75 Ω , no insulation |
| 5) | USB
Standard | USB 2.0 Standard, insulation |
| 6) | RS232
Standard
Function | RS-232C Standard, no insulation, but only with TXD and RXD.
For J-PAD3(remote controller) connection |

7.5.3 J3 Connector

- | | | |
|----|---|--|
| 1) | Connector
ID color
Name
Connector name
Plug name | Blue
REMOTE
LEMO EGG.2B.318
LEMO FGG.2B.318 |
| 2) | Ethernet
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

Function | 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)
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
Standard
Refer to APPENDIX E for details. | 3 V(p-p)(1~10 V(p-p)), high impedance, insulation
IRIG Standard 200-98 |
| 5) | TRIG2 Trigger Input
Signal level

Function
Refer to APPENDIX A for details. | Current loop with photo coupler, insulation
Current limiter resistance 1500 Ω , maximum applied voltage \pm 32V
Trigger valid at 5V or more. Reverse polarity function. |
| 6) | EPO Output
Signal level
Refer to APPENDIX C for details. | TTL level, insulation. Reverse polarity function. |

Note) Only when the camera head is connected to CAM PORT1, the exposure pulse is output.

- | | | |
|----|---|--|
| 7) | Power Control
Signal level

Function
Refer to APPENDIX D for details. | 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)
Power ON with H, power OFF with L. No reverse polarity function. |
|----|---|--|

7.5.4 Power Connector (8ch DRP)

- | | | |
|----|--|---|
| 1) | Name | PWR |
| 2) | Connector name | LEMO EGG.2B.303 |
| | Plug name | LEMO FGG.2B.303 |
| 3) | Input Power | |
| | Power voltage | DC20—32V |
| | Input power | DC power (AC adapter) or the included battery |
| | Power consumption | Approximately 120W(DRP : Approximately 75W) |
| | | Eight camera head (without BB1 Unit) connection, ARM mode, DC24V when not connected to a peripheral device. |
| | | Power consumption that increases and decreases with one camera head: MAX Approximately 5.5W |
| | Power protection | |
| | Reverse polarity | internal fuse (replaceable by user) |
| | Excess charge | 35VDC, 1 minute |
| | With remote power control function (Refer to 【7.5.3】) | |

7.5.5 PORT Connector

- | | | |
|----|---|--|
| 1) | Connector Name | LEMO EGG.2B.326 or ODU G13L0C-P26LFG0-0000 |
| | Plug Name | LEMO FGG.2B.326 or ODU S23L0C-P26PFC0-020S |
| 2) | Camera head connection signal, Camera head power supply | |
| | 8ch DRP has PORT1~8. 4ch DRP has PORT1~4. | |

7.5.6 Pin Numbers

- | | | |
|-----|--------------|------------------------------------|
| 1) | J1 Connector | |
| | 1 | NC (8ch DRP) / DC24V IN (4ch DRP) |
| | 2 | NC (8ch DRP) / DC24V RTN (4ch DRP) |
| | 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

4)	Power Connector (8ch DRP only)	
	1	DC24V IN
	2	FRAME GND
	3	DC24V RTN
	shell	FRAME GND

5)	PORT1~PORT8 Connector	
	1	DTC+
	2	DTC -
	3	CTD0+
	4	CTD1+
	5	CTD1-
	6	CTD2+
	7	CTD2-
	8	CTD4+
	9	CTD4-
	10	CTD5+
	11	CTD5-
	12	CTD6+
	13	CTD7+
	14	CTD7-
	15	NC
	16	CTD0-
	17	NC
	18	CLK+
	19	CLK-
	20	NC
	21	NC
	22	CTD6-
	23	CTD3+
	24	CTD3-
	25	DC16V IN
	26	DC16V RTN
	shell	FRAME GND

8ch DRP has PORT1~8. 4ch DRP has PORT1~4.

7.6 Environment

- 1) Operating temperature and humidity 0~40°C, 30~80%RH (no condensation)
- 2) Saving temperature and humidity -10~60°C、 20~80%RH(no condensation)
- 3) Vibration MIL-STD-810C METHOD 514.2 CATEGORY b2 standard
(RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
- 4) Shock
 DRP
 8ch DRP Half-sine, 11msec, 100G, 6 axes total 1,000 times
 4ch DRP Half-sine, 11msec, 100G, 6 axes total 1,000 times

 Camera Head
 P2-Cam, S2-Cam, C-Cam
 Half-sine, 11msec, 150G, 6 axes total 1,000 times
 μ-Cam Camera head
 Half-sine, 11msec, 150G, 6 axes total 1,000 times
 μ-Cam RELAYBOX
 Half-sine, 11msec, 150G (100G in the direction of the connector)
 6 axes total 1,000 times
 HR-Cam
 Half-sine, 11msec, 150G (100G in the direction of the connector)
 6 axes total 1,000times

7.7 Shape

7.7.1 DRP

7.7.1.1 GX-5 8ch DRP

- | | |
|--|---|
| 1) Exterior dimensions | Approximately W290rH142rD240mm(excluding connector, protruding parts and options) |
| 2) Weight
(excluding cables, handle, and options) | 2/4/8GB Model:Approximately 13 kg
Handle (including screws):Approximately 0.14kg |

7.7.1.2 GX-5 4ch DRP

- | | |
|------------------------|---|
| 1) Exterior dimensions | Approximately W270 × H146 × D150mm(excluding connector, protruding parts and options) |
| 2) Weight | 2/4/8GB Model:Approximately 7.5 kg
(excluding cables, handle, and options)
Handle (including screws):Approximately 0.07kg |

7.7.2 Camera Head

7.7.2.1 P2-Cam

- | | |
|---|--|
| 1) Exterior dimensions (excluding lens, cable, mounting plate and tripod) | SS Type Approximately W25×H25×D85mm
SA Type Approximately W25×H25×D88mm
AS Type Approximately W25×H25×D94mm
AA Type Approximately W25×H25×D97mm |
| 2) Weight | Only Camera Head Main body Approximately 100g
Camera Head Main body + Standard cable Approximately 230g
Camera Head Main body + Casing tube cable Approximately 290g |
| 3) Cable | Pigtail part: Length Approximately 0.6m |
| 4) Cable diameter | Standard cable Approximately 8.8mm
Casing tube cable Approximately 12.3mm |
| 5) Connector | Plug : LEMO FGG.3B.326 or ODU S23L0C-P26PFC0-020S
Main body of camera head + cable Approximately 230g |
| 6) Tripod mounting screw hole | 1/4-20UNC DEPTH6mm (for tripod plate use)
Tripod plate is option. |
| 7) Tripod plate mounting screw | M2X8mm 2screw |
| 8) Power consumption | Approximately 3.8W |
- * If using the optional NF-C mount adapter, it is possible to switch from the NF mount to the C mount. However, the camera head mounting bracket cannot be used together with the tripod plate.

7.7.2.2 S2-Cam

- | | |
|---|--|
| 1) Exterior dimensions (excluding lens, cable, mounting plate and tripod) | |
| Straight Type | Imager part Approximately W25 × H25 × D25mm
Interface part Approximately W25 × H25 × D80mm |
| Side Type | Same as above |
| 2) Weight | Standard cable type Approximately 270g (excluding lens)
Casing tube cable type Approximately 330g (excluding lens)
• Imager part Approximately 30g (excluding lens)
• Interface part Approximately 125g (excluding cable) |
| 3) Cable1 | Pigtail part: Length Approximately 0.6m |
| 4) Cable2 | Imager, interface interval : Length Approximately 0.9m |
| 5) Cable1 diameter | Standard cable Approximately 8.8mm
Casing tube cable Approximately 12.3mm |
| 6) Cable2 diameter | Approximately 3.8mm |
| 7) Tripod mounting screw hole | 1/4-20UNC DEPTH6mm (for tripod plate use)
Tripod plate is option. |
| 8) Connector | Plug : LEMO FGG.3B.326 or ODU S23L0C-P26PFC0-020S |

- 9) Power consumption Approximately 3.8W
- * If using the optional NF-C mount adapter, it is possible to switch from the NF mount to the C mount. However, the camera head mounting bracket cannot be used together with the tripod plate.

7.7.2.3 HR-Cam

- 1) Exterior dimensions (excluding lens, cable, mounting plate and tripod)
- | | |
|---------------|-----------------------------|
| Straight Type | Approximately W80×H75×D90mm |
| Side Type | Same as above |
- 2) Weight Approximately 980g (excluding lens, cable)
- 3) Cable Camera cable : Length Approximately 3m , 4m , 5m
Straight type , angle type (3m and 4m)
- 4) Cable diameter Approximately 8.8mm
- 5) Connector Name LEMO EGG.2B.326
Plug Name LEMO FGG.2B.326
- 6) Tripod mounting screw hole 1/4-20UNC DEPTH9mm (for tripod plate use)
- 7) Power consumption Approximatel 13.5W
- 8) Anti-G Bracket mounting screw M3x12 (Anti-G Bracket use)
Anti-G Bracket is option.

* If using the optional C mount adapter, NM mount adapter or G type F mount adapter, it is possible to use any type of lens (C, NM, G type F mount lens).

7.7.2.4 C-Cam

- 1) Exterior dimensions (excluding lens, cable, mounting plate and tripod)
- | | |
|---------------|-----------------------------|
| Side Type | Approximately W57×H35×D35mm |
| Straight Type | Approximately W35×H35×D58mm |
- 2) Weight
- | | |
|-----------------------------------|-------------------------------------|
| Only Camera Head Main body | Side Type Approximately 120g |
| | Straight Type Approximately 140g |
| Side Type + Standard cable | Approximately 250g |
| Side Type + Casing tube cable | Approximately 310g |
| Straight Type + Standard cable | Approximately 270g |
| Straight Type + Casing tube cable | Approximately 330g |
- 3) Cable Pigtail part: Length Approximately 0.6m
The cable type is two kinds of a standard cable and the casing tube cable
- 4) Cable diameter Approximately 8.8mm (Standard cable)
Approximately 12.3mm (Casing tube cable)
- 5) Connector Plug : LEMO FGG.3B.326 or ODU S23L0C-P26PFC0-020S
- 6) Screw hole M3 : Depth 4mm
Side Type 5 each on top/bottom and 4 each on side/rear
Straight Type 4 each on top/bottom/left/right
- 7) Power consumption Approximately 5.3W

7.7.2.4 μ-Cam

- 1) Exterior dimensions (excluding lens, cable, mounting plate and tripod)
- | | | |
|-------------|----------|------------------------------|
| Camera head | Side | Approximately W15×H16×D16mm |
| | Straight | Approximately W16×H16×D27mm |
| RELAYBOX | | Approximately W30×H30×D100mm |
- 2) Weight
- | | | |
|-------------|----------|--|
| Camera head | Side | Approximately 75g (with mounting plate)
Approximately 70g (no mounting plate) |
| | Straight | Approximately 77g (with mounting plate)
Approximately 70g (no mounting plate) |
| RELAYBOX | | Approximately 200g (no mounting plate) |
- 3) Cable Camera head Pigtail part: Length Approximately 2m
RELAYBOX HRCam cable: Length 3m, 4m, 5m
The cable type is two kinds of a standard cable and the casing tube cable

4) Cable diameter	Camera head	Approximately 3.7mm
	RELAYBOX	HR-Cam cable Approximately 8.8mm
5) Connector	Camera head	HTK HDR26P Male
	RELAY BOX (DRP side)	LEMO ECG.2B.326
	(Camera head side)	HTK HDR26P Female
6) Screw hole	Camera head M2 : Depth 2mm	
	Side	4 each on bottom/rear
	Straight	4 on bottom
	RELAY BOX	No
7) Power consumption	Approximately 5.5W	

7.8 Adaptive Standards

- | | |
|----------------------------------|---------------------|
| 1) Safety standard | EN60950 |
| 2) Electromagnetic adaptability | EN55022 |
| | EN55024 |
| | FCC Part 15 Class A |

7.9 Accuracy

- 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.
- 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.

- Memory Backup Batteries Refer to 【7.4.6】
- 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 GX-5 DRP must be returned to the factory for replacement.

7.11 Specifications of the Main Attachments

7.11.1 Cables

- 1) Simple J1 Cable (for GX-5 8ch DRP)

P1	Camera plug	(ID color : yellow)	LEMO FGG.2B.310
P11	TRIG1	Trigger 1 input	BNC receptacle

- 2) Simple J1 Cable (for GX-5 4ch DRP (together with GX-1))

P1	Camera plug	(ID color : yellow)	LEMO FGG.2B.310
P10	POWER	Power input	LEMO PHG.1B.303
P12	TRIG1	Trigger 1 input	BNC receptacle

- 3) Simple J2 Cable

P 2	Camera plug	(ID color : green)	LEMO FGG.2B.316
P21	USB	USB	USB series A receptacle
P22	VF	Viewfinder	Hirose HR10A-7P-6S(73)
P23	JPAD	J-PAD3	LEMO PHG.0B.306

- 4) Simple J3 Cable

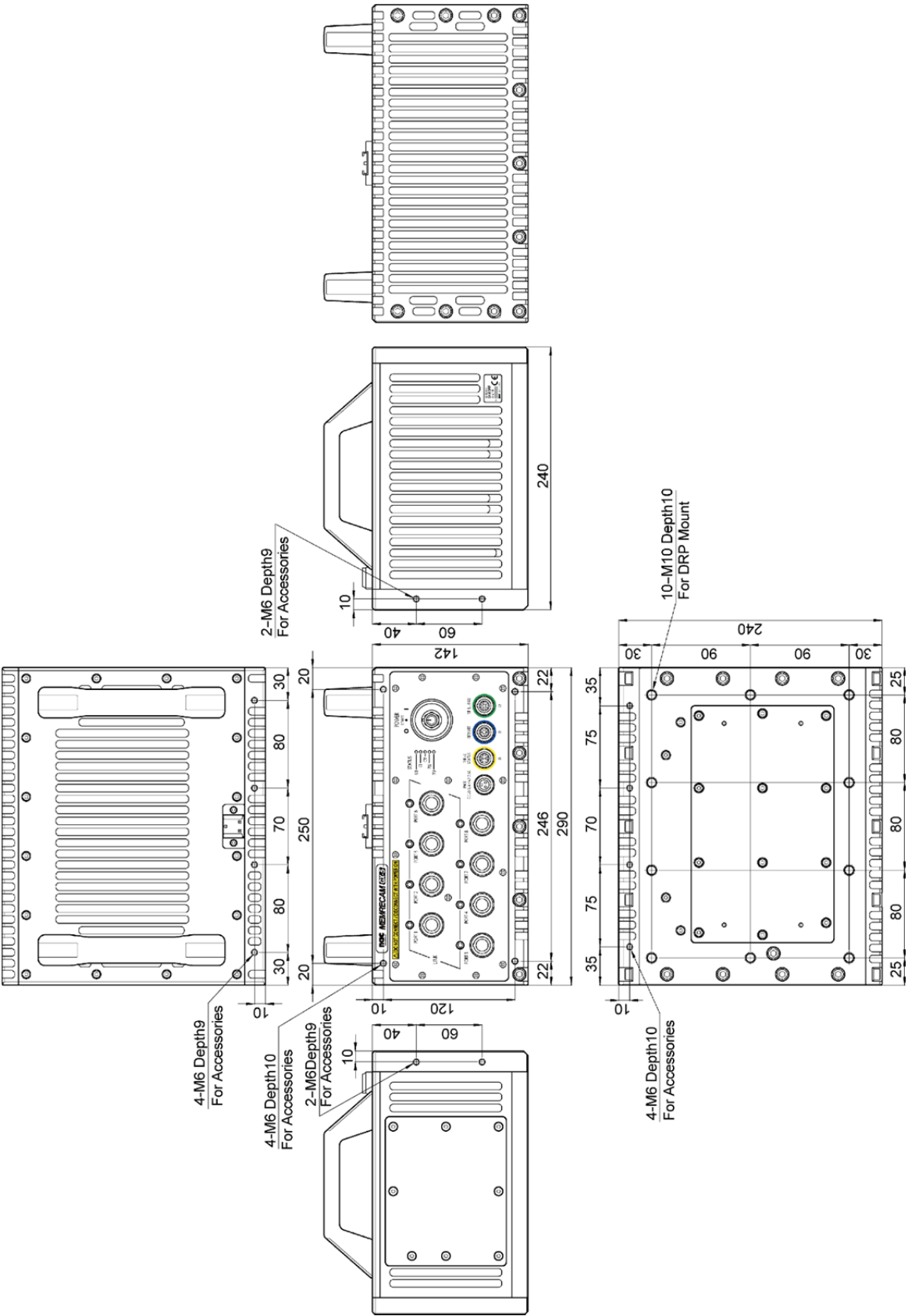
P3	Camera plug	(ID color : blue)	LEMO FGG.2B.318
P31	ETHER	ETHERNET	RJ45 receptacle

- 5) Video BNC conversion cable

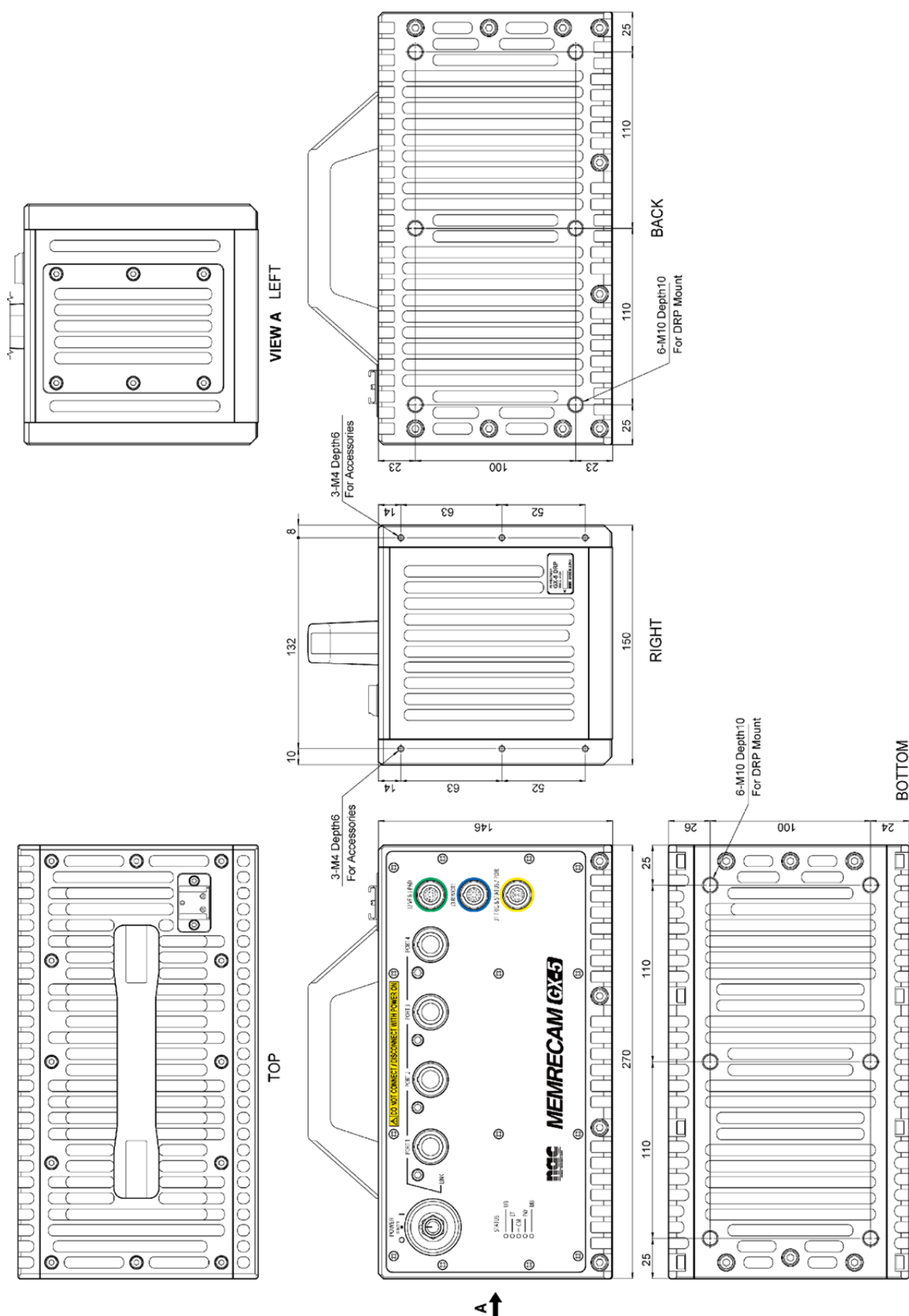
P1	J2 Cable plug	VF	Hirose HR10A-7J-6P(73)
P2	Monitor	NTSC/PAL	BNC plug

7.12 Exterior Diagram

7.12.1 GX-5 8ch DRP



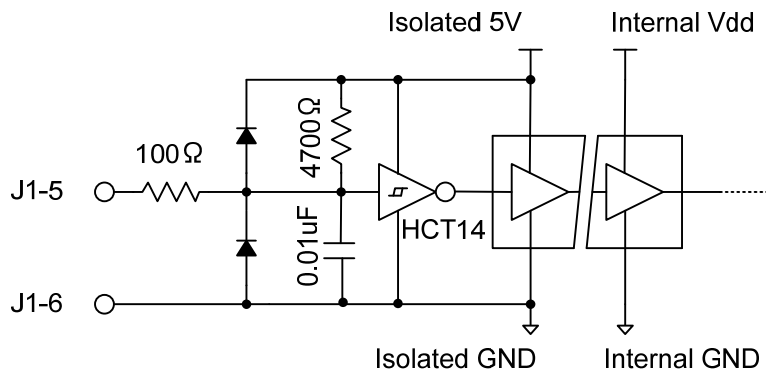
7.12.2 GX-5 4ch DRP



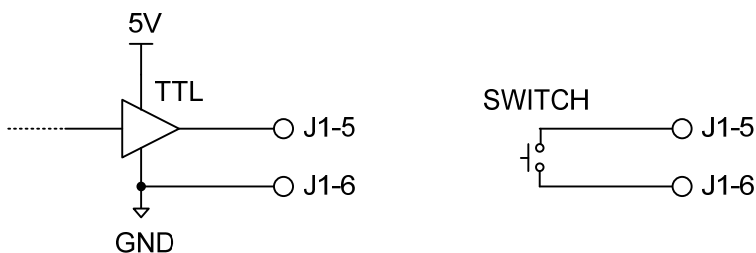
APPENDIX A Trigger

A1. TRIG1

- Equivalent Circuit Diagram for Input



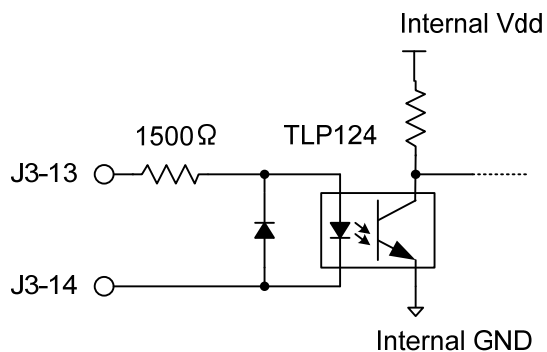
- Recommended interface circuit



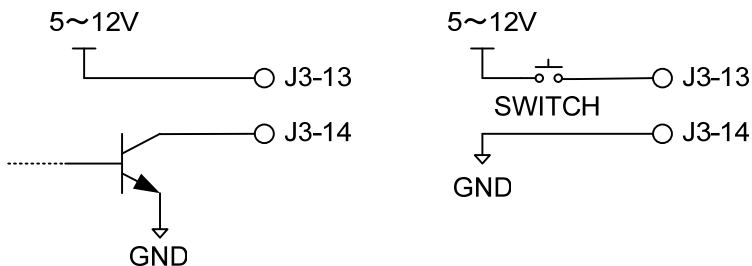
A2. TRIG2

- 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.



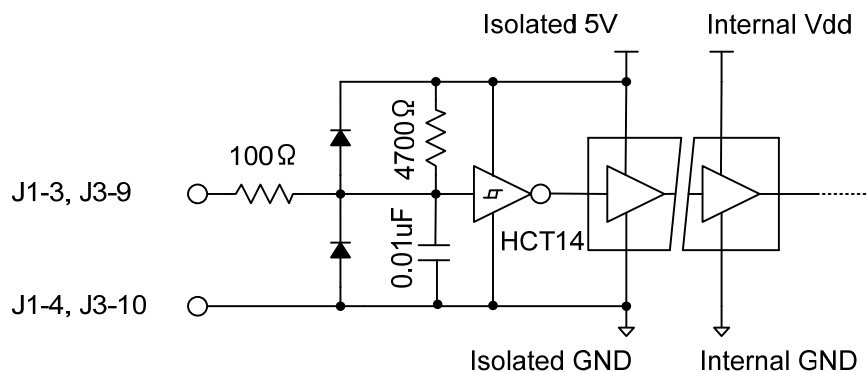
- Recommended interface circuit



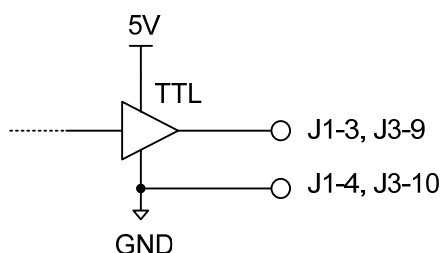
APPENDIX B Exposure Start Signal (EST) and Event Signal

B1. EST1、EST2 / EVENT

- Equivalent Circuit Diagram for Input

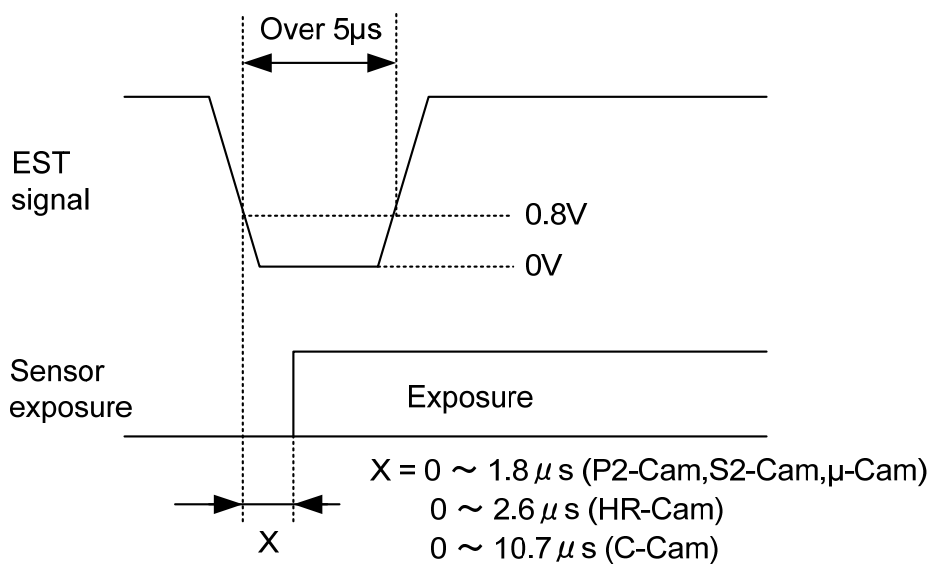


- Recommended interface circuit



B2. Timing

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



B3. 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.

Recording could be failed if timing of EST signal cycle & exposure time goes out of the following condition

$$\text{EST signal cycle} > \text{Exposure time (shutter)} + 0.9\mu\text{s}$$

- Restriction on C-Cam, μ -Cam use

The frame rate must be set at triple or more that of the maximum frequency (inverse of the shortest cycle) for the external exposure start signal. If this condition is not met, the image will be under- or over-exposed.

It is possible to use multiple C-Cams and the EST function can be used but the EST function cannot be used when mixed with other types of cameras, such as the P2-Cam and such.

B4. Event Signals

The input signal level (if the J3 connector contact pin level is a valid level) is saved along with the image.

Verify the event signal valid polarity/invalid polarity via video output or the HXLink screen.

There are no limits on the number of event signal input.

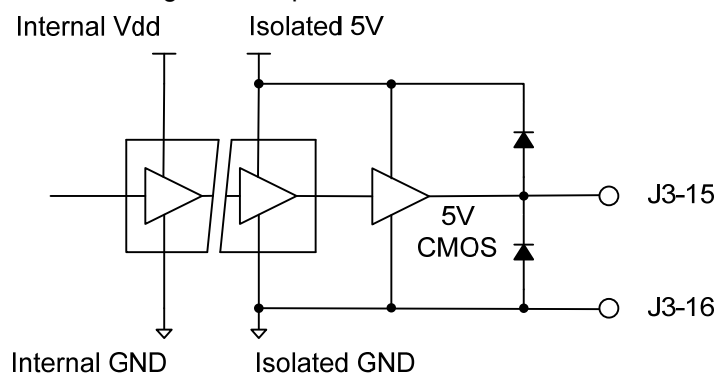
There is no jump function.

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

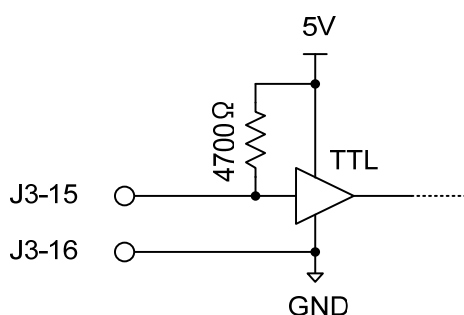
APPENDIX C Exposure Pulse Output (EPO)

C1. EPO

- Equivalent Circuit Diagram for Input

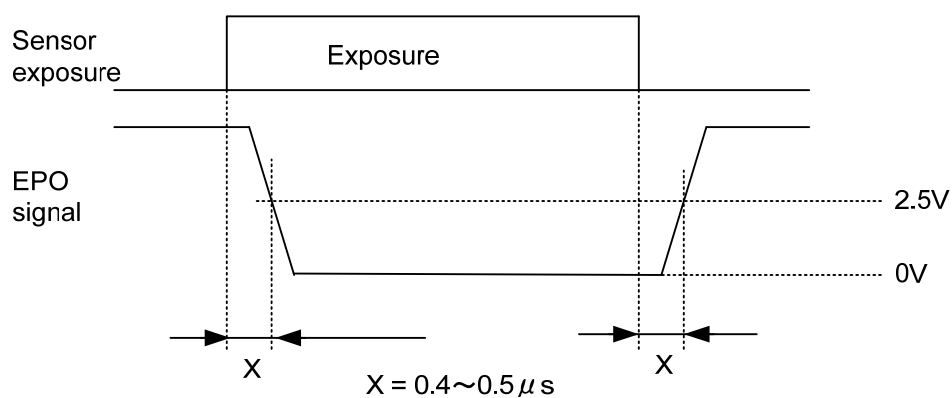


- Recommended interface circuit (In case of without external noise)



C2. Timing

The EPO signal delay relative to exposure is as follows



The exposure time and the jitter (shift from nearby exposure time) .

P2-Cam、S2-Cam、HR-Cam、C-Cam	within $\pm 1.5\mu\text{sec}$
$\mu\text{-Cam}$	within $\pm 8.2\mu\text{sec}$

C3. Simple Synchronized Recording

Simple synchronized recording 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 recording 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 recording 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

Only when the camera head is connected with CAM PORT1, the exposure pulse is output.

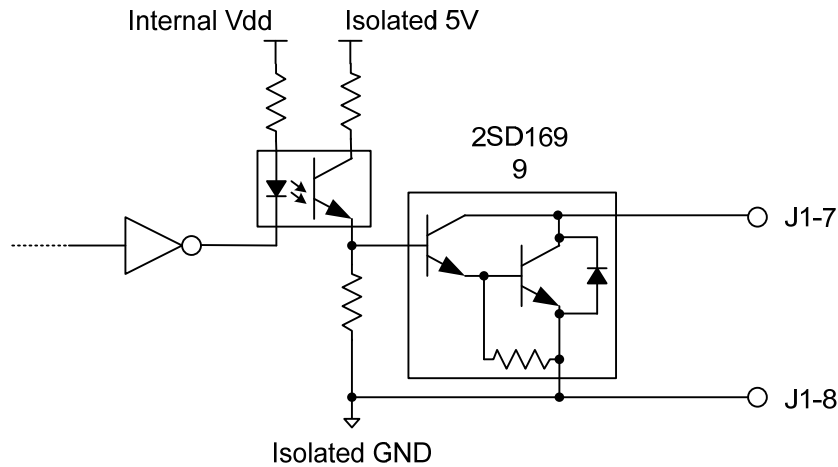
Since the exposure pulse output (EPO) signals are identical to the exposure time (shutter speed), the pulse widths are narrowed when a short exposure time is set. Precaution is necessary for signal transmission conversion to the proper interface and for the cable properties.

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

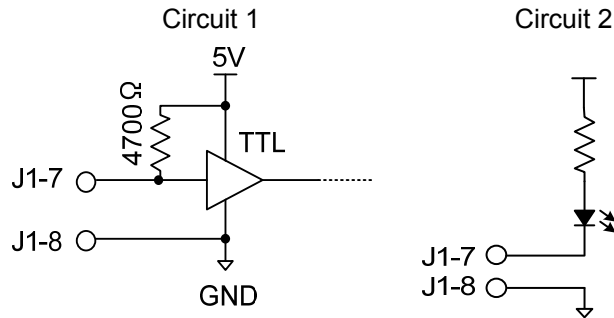
APPENDIX D Discrete Interface

D1. ARM Status Output

- Equivalent Circuit Diagram for Input



- Recommended interface circuit



- Example of Method Used

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

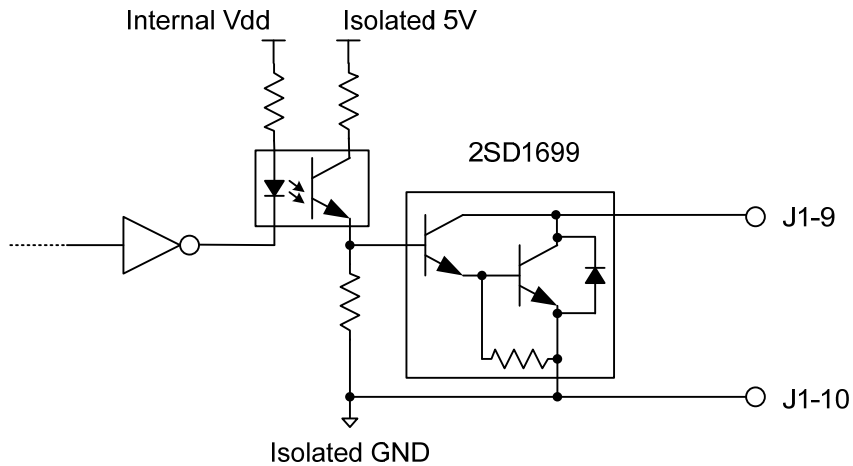
Circuit 2 is a circuit that visually checks the ARM status in the LED display. Set ARM to output the L level to light ARM.

To detect if multiple cameras are in ARM, use circuit 1, connect the ARM status output for all of the cameras (wired AND) and set ARM to output the H level. If even one camera is not in ARM, it switches to L level.

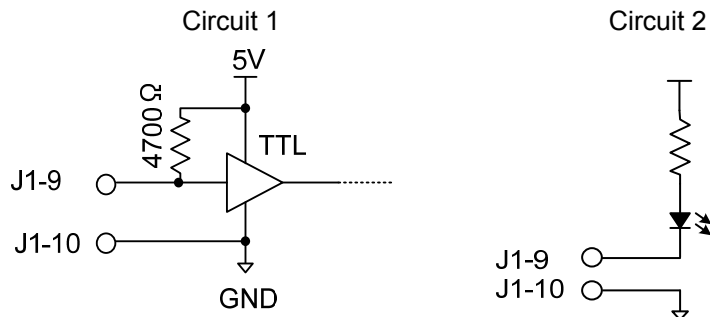
Take note that when the camera power is OFF, the output is at H.

D2. FAULT Status Output

- Equivalent Circuit Diagram for Input



- Recommended interface circuit



- Example of Method Used

Circuit 1 of the recommended 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.

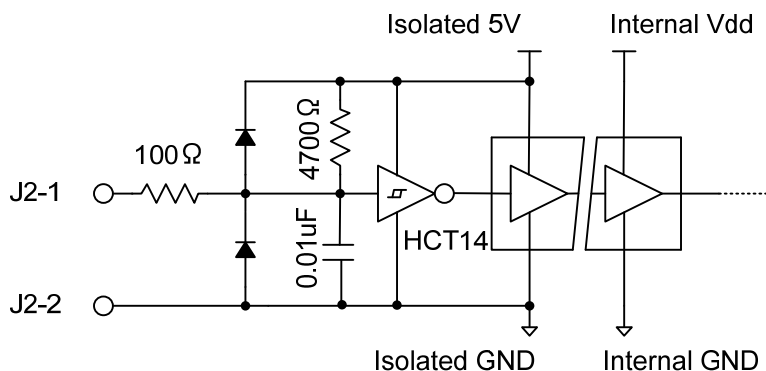
To detect if multiple cameras are in FAULT use circuit 1, connect the FAULT status output for all of the cameras (wired NOR) and set FAULT to output the L level. If all of the cameras are not in FAULT, it switches to H level.

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

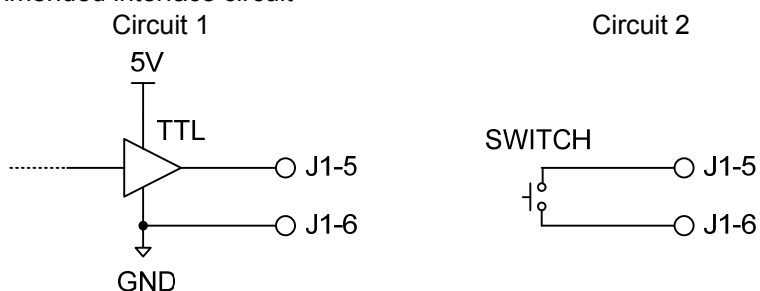
D3. ARM Command Input

- Equivalent Circuit Diagram for Input

- Equivalent Circuit Diagram for Input



- Recommended interface circuit



- Example of Method Used

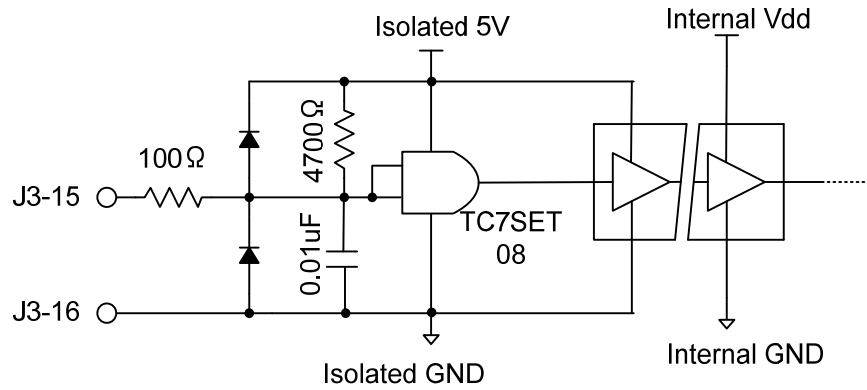
Circuit 1 of the recommended interface circuit is a circuit where the command is input in logic signals. The logic level can be set to H / L.

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.

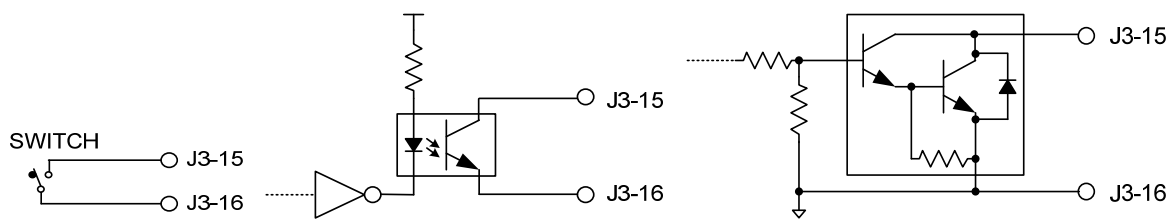
If the ARM command signal is not connected (open state), note that it will be at the H level.

D4. Power Control Input

- Equivalent Circuit Diagram for Input



- Recommended 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.

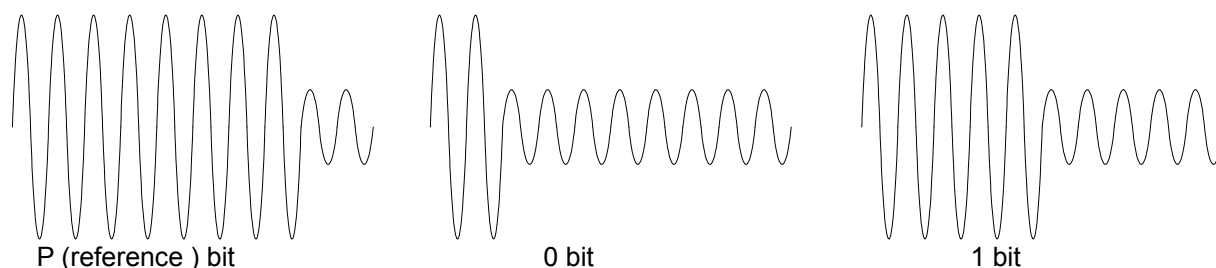
APPENDIX E IRIG-B

E1. Standard : IRIG Standard 200-98, IEEE1344

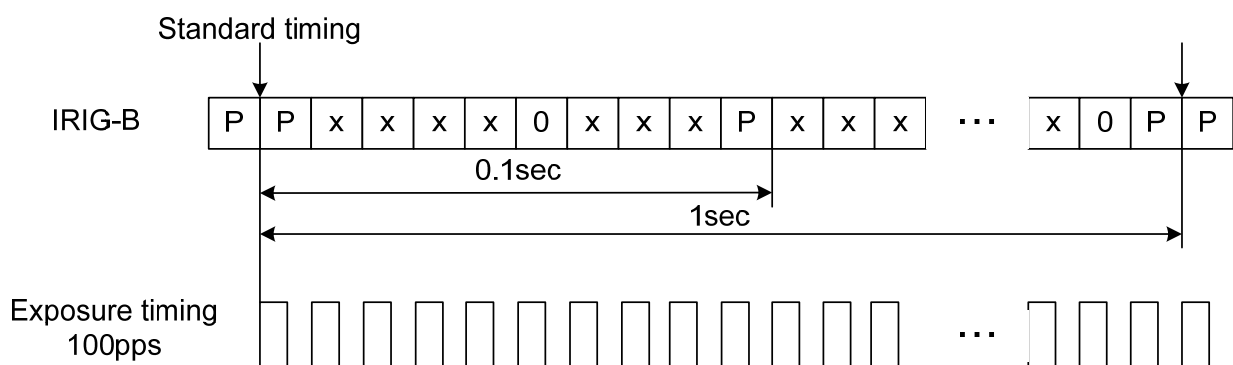
Compatible with 1kHz carrier modulation IRIG-B (B120, B122, B123 format).
Not compatible with unmodulated IRIG-B (B000, B003 format).

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

Even if the multiple camera heads of GX-5 is connected, the exposure phase shift setting cannot set a different respectively value.

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 recording. 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 640 x 480 pixels, each DRP is set to 1,000 frames/sec, and four DRPs are subject to IRIG synchronization. With the respective phase shift for each DRP set to 0° , 90° , 180° , and 270° , recording can be conducted at 1,000 x 4=4,000 pps.

1,000 frames/sec involves a frame interval of 1,000µsec so each camera shifts only 0µsec, 250µsec, 500µsec, and 750µsec from the IRIG-B standard time.

Note) With standard multiple synchronized DRP systems (such as GX-HUB system), the exposure time for all of the DRPs is synchronized so the phase shift should be set to 0° .

APPENDIX F AUTO PILOT

GX series cameras have the Auto Pilot function that executes the pre-programmed commands automatically after turning on the power supply.
(Old versions of the firmware does not correspond to this function.)

The USB device that contains the sequence file (SEQUENCE.DAT) should be connected to the GX series cameras while the main power of the power supply is OFF in order to execute the pre-programmed command with this function. When the camera is turned ON, it automatically identifies the sequence file..

Sequence file (SEQUENCE.DAT) can be made and edited with the auto pilot sequence making tool, which is automatically installed together with HXLink.

Note) Refer to **【HXLink User's Manual】** for the setting .

8

Options

8.1 Specifications of the Main Options

8.1.1 AC adapter for GX-5 8ch DRP (no G-resistant function)

- 1) Input AC100~240V、47~63Hz
Connector : AC 3 pin connector
 - 2) Output DC28V、14.29A (max) , at this point, the efficiency is at least 89%
Connector : LEMO EGG.2B.303
 - 3) Operating temperature and humidity 0~+70°C、5~95%RH, no condensation
 - 4) Operating temperature and humidity -40~+85°C、5~95%RH, no condensation
 - 5) Exterior dimensions Approximately W120x H49.3 x D250 mm (Without connector etc)
 - 6) Weight Approximately 1.4kg
 - 7) Power switch Yes
- Note) Ground the AC 3 pin connector. If not grounded, electrical shock may occur when GX-5 DRP or GX-HUB is touched.

8.1.2 AC adapter for GX-5 4ch DRP (no G-resistant function)

- 1) Input AC100~240V、47~63Hz
Connector : AC 3 pin connector
 - 2) Output DC24V、5A (max) , at this point, the efficiency is at least 85%
Connector : LEMO FGG.1B.303
 - 3) Operating temperature and humidity 0~+60°C、5~95%RH, no condensation
 - 4) Operating temperature and humidity -40~+85°C、5~95%RH, no condensation
 - 5) Derating 100% (40°C) , 50% (60°C)
 - 6) Exterior dimensions Approximately W76 x H43.7 x D184 mm Without connector etc)
 - 7) Weight Approximately 1.1kg (include an AC 3 pin cable)
 - 8) Power switch Yes
- Note) Ground the AC 3 pin connector. If not grounded, electrical shock may occur when GX-5 DRP or GX-HUB is touched.

8.1.3 J-PAD3 (no G-resistant function)

- 1) Power Supplied from GX-5 DRP
- 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 2m
- 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

8.1.4 Cables

- 1) J1 Branch Cable (BNC plug)

P1	DRP 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) J1 Branch Cable (BNC receptacle)
- | | | | |
|-----|----------|---------------------|-----------------|
| P1 | DRP Plug | (ID color : yellow) | LEMO FGG.2B.310 |
| P10 | POWER | Power input | LEMO PHG.1B.303 |
| P11 | EST1 | EST1 input | BNC receptacle |
| P12 | TRIG1 | Trigger1 input | BNC receptacle |
| P13 | ARM-O | ARM Status output | BNC receptacle |
| P14 | FAULT | FAULT Status output | BNC receptacle |
- 3) J2 Branch Cable (BNC plug)
- | | | | |
|-----|----------|--------------------|-------------------------|
| P2 | DRP 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 | J-PAD3 | LEMO PHG.0B.306 |
- 4) J2 Branch Cable (BNC receptacle)
- | | | | |
|-----|----------|--------------------|-------------------------|
| P2 | DRP Plug | (ID color : green) | LEMO FGG.2B.316 |
| P20 | ARM-I | ARM command input | BNC receptacle |
| P21 | USB | USB | USB series A receptacle |
| P22 | VF | Viewfinder | Hirose HR10A-7P-6S(73) |
| P23 | JPAD | J-PAD3 | LEMO PHG.0B.306 |
- 5) J3 Branch Cable (BNC plug)
- | | | | |
|-----|----------|-----------------------|-----------------|
| P3 | DRP 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 |
- 6) J3 Branch Cable (BNC receptacle)
- | | | | |
|-----|----------|-----------------------|-----------------|
| P3 | DRP Plug | (ID color : blue) | LEMO FGG.2B.318 |
| P31 | ETHER | ETHERNET | RJ45 receptacle |
| P32 | EST2 | EST2 input | BNC receptacle |
| P33 | IRIG-B | IRIG-B input | BNC receptacle |
| P34 | TRIG2 | Trigger2 input | BNC receptacle |
| P35 | EPO | Exposure pulse output | BNC receptacle |
| P36 | PWRCNT | Power control input | BNC receptacle |
- 7) Simple J1 Cable (Angle type, BNC plug)
- | | | | |
|-----|----------|---------------------|-----------------|
| P1 | DRP Plug | (ID color : yellow) | LEMO FHG.2B.310 |
| P10 | POWER | Power input | LEMO PHG.1B.303 |
| P12 | TRIG1 | Trigger1 input | BNC plug |
- 8) Simple J1 Cable (Angle type, BNC receptacle)
- | | | | |
|-----|----------|---------------------|-----------------|
| P1 | DRP Plug | (ID color : yellow) | LEMO FHG.2B.310 |
| P10 | POWER | Power input | LEMO PHG.1B.303 |
| P12 | TRIG1 | Trigger1 input | BNC receptacle |
- 9) Simple J2 Cable (Angle type)
- | | | | |
|-----|----------|--------------------|-------------------------|
| P2 | DRP Plug | (ID color : green) | LEMO FHG.2B.316 |
| P21 | USB | USB | USB series A receptacle |
| P22 | VF | Viewfinder | Hirose HR10A-7P-6S(73) |
| P23 | JPAD | J-PAD3 | LEMO PHG.0B.306 |

1 0) Simple J3 Cable (Angle type)

P3	DRP Plug	(ID color : blue)	LEMO FHG.2B.318
P31	ETHER	ETHERNET	RJ45 receptacle

1 1) J1 Branch Cable (Angle type, BNC plug)

P1	DRP Plug	(ID color : yellow)	LEMO FHG.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

1 2) J1 Branch Cable (Angle type, BNC receptacle)

P1	DRP Plug	(ID color : yellow)	LEMO FHG.2B.310
P10	POWER	Power input	LEMO PHG.1B.303
P11	EST1	EST1 input	BNC receptacle
P12	TRIG1	Trigger1 input	BNC receptacle
P13	ARM-O	ARM Status output	BNC receptacle
P14	FAULT	FAULT Status output	BNC receptacle

1 3) J2 Branch Cable (Angle type, BNC plug)

P2	DRP Plug	(ID color : green)	LEMO FHG.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	J-PAD3	LEMO PHG.0B.306

1 4) J2 Branch Cable (Angle type, BNC receptacle)

P2	DRP Plug	(ID color : green)	LEMO FHG.2B.316
P20	ARM-I	ARM command input	BNC receptacle
P21	USB	USB	USB series A receptacle
P22	VF	Viewfinder	Hirose HR10A-7P-6S(73)
P23	JPAD	J-PAD3	LEMO PHG.0B.306

1 5) J3 Branch Cable (Angle type, BNC plug)

P3	DRP Plug	(ID color : blue)	LEMO FHG.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

1 6) J3 Branch Cable (Angle type, BNC receptacle)

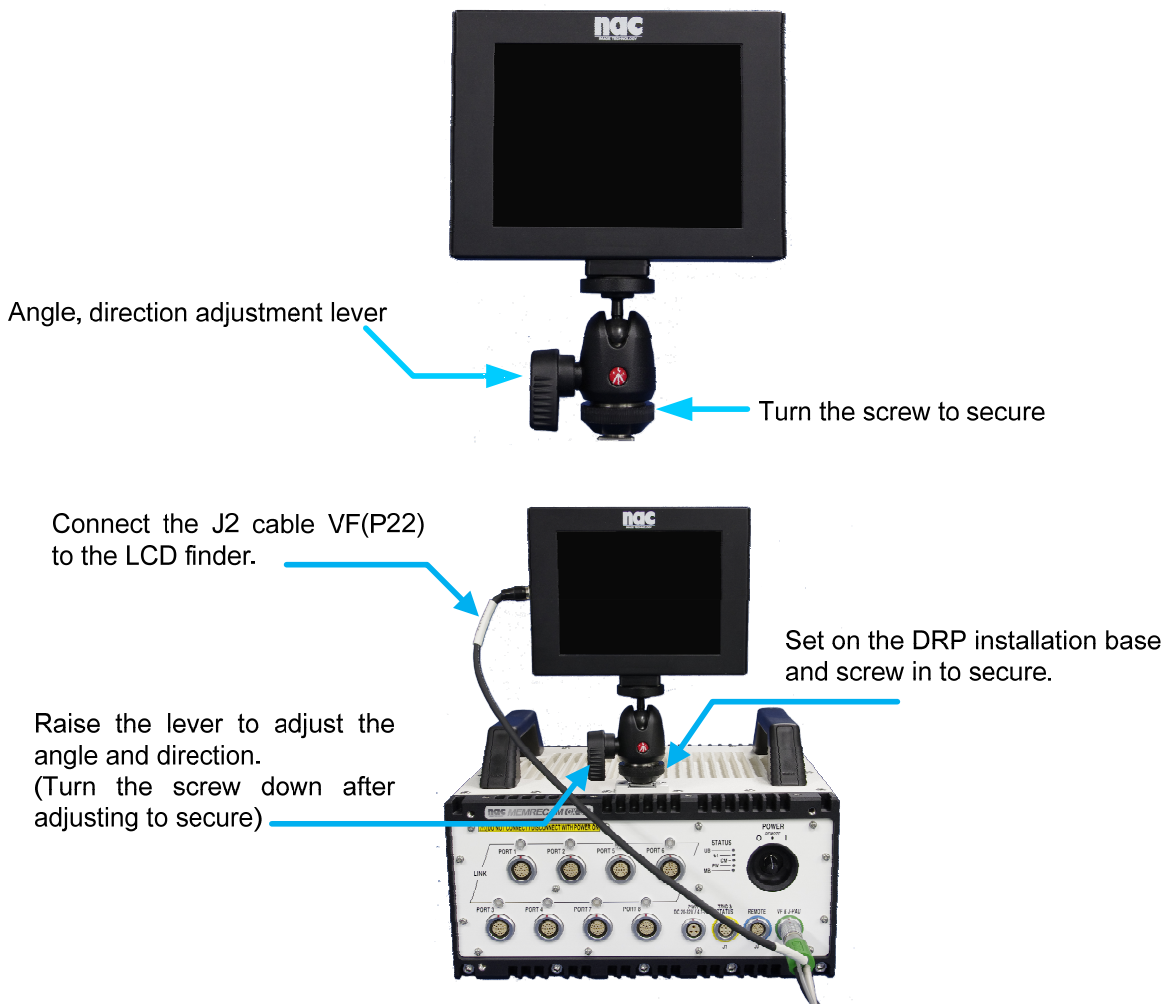
P3	DRP Plug	(ID color : blue)	LEMO FHG.2B.318
P31	ETHER	ETHERNET	RJ45 receptacle
P32	EST2	EST2 input	BNC receptacle
P33	IRIG-B	IRIG-B input	BNC receptacle
P34	TRIG2	Trigger2 input	BNC receptacle
P35	EPO	Exposure pulse output	BNC receptacle
P36	PWRCNT	Power control input	BNC receptacle

1 7) AC ADAPTER – DRP	DC Cable		
P1	DRP Plug	Power input	LEMO FGG.2B.303
P2	AC adapter Plug	Power output	NANABOSHI NJC-20-CB
Cable		VCTF23NXS-1.25-3	
Cable diameter		Approximately 8.5mm	
1 8) DRP loose DC cable			
P1	DRP Plug	Power input	LEMO FGG.2B.303
Loose WHITE	DC24V IN	AWG16 (P1 : 1pin)	
Loose GREEN	FRAME GND	AWG16 (P1 : 2pin)	
Loose BLACK	DC24V RTN	AWG16 (P1 : 3pin)	
Cable		NR-HVCTF-S-3X50/0.18	
Cable diameter		Approximately 8.6mm	
1 9) HR Cam CABLE (straight type) (3m, 4m, 5m)			
P1	Camera plug	LEMO FGG.2B.326	
P2	DRP Plug	LEMO FGG.3B.326 or	
		ODU S23L0C-P26PFC0-020S	
Cable diameter		Approximately 8.8mm	
2 0) HR-A Cam CABLE (Angle type) (3m, 4m)			
J1	Camera plug	LEMO FHG.2B.326	
P1	DRP Plug	LEMO FGG.3B.326 or	
		ODU S23L0C-P26PFC0-020S	
Cable diameter		Approximately 8.8mm	
2 1) Camera extension cable (straight type) (4m, 6m, 8m)			
J1	Camera receptacle	LEMO PHG.3B.326 or	
		ODU KX3L0C-P26LFG0-0001	
P1	DRP plug	LEMO FGG.3B.326 or	
		ODU S23L0C-P26PFC0-020S	
Cable diameter		Approximately 12.9mm	
2 2) Bundling cable tube			
Cable diameter		Approximately W123 X L1500 mm	
		(when tube is extended)	

8.1.5 5.7 inch LCD Viewfinder (No G-resistant function)

- | | | |
|-----|------------------------------------|--|
| 1) | Power | DC24V (20~32V, supplied from GX-5 DRP, power switch included) |
| 2) | Maximum power consumption | 10 W |
| 3) | Operating temperature and humidity | 0~50°C, 30~80%RH(no condensation) |
| 4) | Storage temperature and humidity | -25~+80°C |
| 5) | Exterior dimensions | Approximately W155 x H117 x D35 mm (without the projection part etc) |
| 6) | Weight | Approximately 600 g |
| 7) | Video method | NTSC / PAL automatic conversion |
| 8) | LC panel | 5.7 inch, TFT |
| 9) | Resolution | 640 x 480 |
| 10) | Luminance | 400 cd/m ² |
| 11) | Angle of view | 65 / 65°(left / right), 65 / 40°(top / bottom) |
| 12) | Connector | Power and video supplied from the main camera unit using Hirose HR10A-7R-6P BNC Loop through Output (automatic terminal) |

8.1.5.1 Installation Method for the LCD Finder MEMRECAM GX-5



Note) Do not use the installation base where the user can impact the GX-5 DRP. Damage may occur. Also, installation is not guaranteed if the installation base is vertical.

8.1.6 GX-HUB (G-resistant model)

- | | | |
|-------|------------------------------------|---|
| 1) | Number of GX camera connections | 4 |
| 2) | Power input | DC20~32V, power consumption : maximum 12 W,
AC adapter sold separately |
| 3) | Power switch | Yes、GX-HUB and camera link function ON/OFF |
| 4) | Exterior dimensions | Approximately W280 x H75 x D230 mm (Without connector
etc) |
| 5) | Weight | Approximately 4.1 kg (Include mounting 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 |
| 1 0) | Front port | <ul style="list-style-type: none">• 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 |
| 1 1) | Back port | GXSYS(LEMO Connector FWG.2B.318) 4 ports
GX series camera J3 Connector or GX-HUB GXSYS and
J3 remote cable connection |
| 1 2) | LED display | IRIG, TRIG, EST, LINK(Gbit Ethernet), POWER |

8.1.7 GX-HUBi (No G-resistant function, without FX SYS Connector)

- | | | |
|-------|------------------------------------|---|
| 1) | Number of GX camera connections | 4 |
| 2) | Power input | DC20~32V, power consumption : maximum 12 W,
AC adapter sold separately |
| 3) | Power switch | Yes、GX-HUB and camera link function ON/OFF |
| 4) | Exterior dimensions | Approximately W280 x H72 x D200 mm (Without connector
etc) |
| 5) | Weight | Approximately 1.6 kg (Include mounting 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) | Front port | <ul style="list-style-type: none">• 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 |
| 9) | Back port | GXSYS(LEMO Connector FWG.2B.318) 4 ports
GX series camera J3 Connector or GX-HUB GXSYS and J3
remote cable connection |
| 1 0) | LED display | IRIG, TRIG, EST, LINK(Gbit Ethernet), POWER |

8.1.8 GX Remote cable

P1	DRP plug	LEMO FGG.2B.318
P2	GX-HUB receptacle	LEMO PHG.2B.318
Cable diameter		Approximately 9.2mm

8.1.9 GX Remote cable (Male—Male) : For GX-HUBi,

P1	DRP plug	LEMO FGG.2B.318
P2	GX-HUB plug	LEMO FGG.2B.318
Cable diameter		Approximately 9.2mm

8.1.10 BB1 UNIT (G-resistant model)

- 1) Operating temperature and humidity 0~40°C, 30~80%RH (no condensation)
- 2) Storage temperature and humidity -10~60°C, 20~80%RH (no condensation)
- 3) POWER Supplied from GX-5 DRP (+16V) , Approximately 2W
- 4) LED Status Display
 - Green : Normal
 - Red : Abnormal communication with DRP
 - Orange : Abnormal communication with the camera
 - Not lit : No power
- 5) Exterior dimensions Approximately W42 x H31.4 x D143 mm
(not including Cable)
- 6) Weight Approximately 1.3kg (including Cable)
- 7) Vibration MIL-STD-810C METHOD 514.2 CATEGORY b2 standard
(RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
- 8) Shock Half-sine, 11msec, 100G
(100G in the direction of the connector)
- 9) Cable Pig tail structure : Length Approximately 5m
- 1 0) Cable diameter Approximately 12.9mm
- 1 1) Connector Plug: ODU SX3L0C-P26PFG0-0001 (Pig tail) or
LEMO FGG.3B.326 (Pig tail)
Receptacle: ODU G13L0C-P26LFG0-0000 or
LEMO EGG.3B.326

8.1.11 P2-Cam, S2-Cam Tripod Plate

- 1) Exterior dimensions Approximately W25 x H8 x D10 mm
- 2) Tripod mounting screw 1/4-20UNC DEPTH6mm

8.1.12 NF-C Mount Adapter (exclusive to P2-Cam, S2-Cam)

- 1) Exterior dimensions Approximately W29.6 x H29.6 x D11.9 mm
- 2) Mounting screw M2x4

8.1.13 HR-Cam G Resistant Bracket

- 1) Exterior dimensions Approximately W130 x H98 x D90.2 mm
- 2) G resistant bracket installation screw M3x12

8.1.14 HR-Cam C Mount Adapter

- 1) Exterior dimensions Approximately W130 x H98 x D90.2 mm

Caution) Replacing mount components requires focal adjustment. The C mount can be used only with the VGA size or less. Vignetting will occur otherwise.

8.1.15 HR-Cam NM Mount Adapter

- 1) Exterior dimensions Approximately W72 x H72 x D23.4 mm

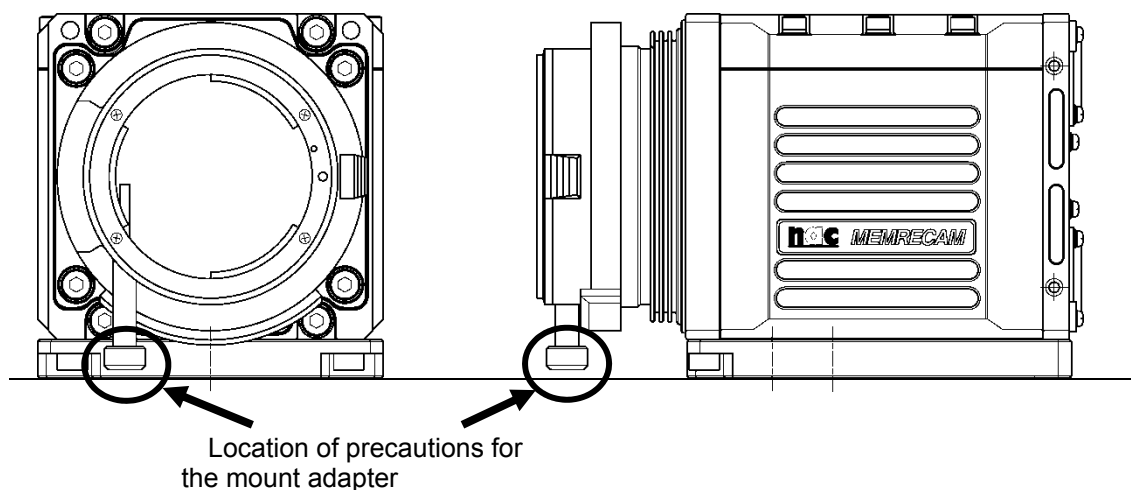
Caution) Replacing mount components requires focal adjustment.

8.1.16 HR-Cam G Type F Mount Adapter

- 1) Exterior dimensions Approximately W130 x H98 x D90.2 mm

Caution) Replacing mount components requires focal adjustment.

If using some of the F mount lens on the HR-Cam, vignetting may occur due to the image resolution. (Example Nikon DX NIKKOR lens)



Caution) If attaching a G type F mount adapter for the HR-Cam, please use with the tripod plate mounted on the camera. Use caution not to mount in the location of precautions for the mound adapter shown in the figure.

8.1.17 SPM Lens (G Resistant Model / exclusive to the P2-Cam, S2-Cam)

- 1) Focal length 4.16 mm
- 2) Aperture F2.8 (fixed)
- 3) Focusing Distance 0.3 m ~ ∞ (pan-focus)
- 4) Image Size 1/2
- 5) Resolution 50 cycles/mm
- 6) Angle of view 90° (horizontal) / 66.9° (vertical) / 114° (opposing angle)
- 7) Distortion (maximum value) -23 % (Barrel shaped)
- 8) Lens Configuration 6 groups of 6
- 9) External dimensions (main lens unit) Φ21x21.4mm (Total length from the front of the camera to the tip of the lens 15.5mm)
- 1 0) Weight Approximately 12 g
- 1 1) Mount Special mount for P2-Cam, S2-Cam
- 1 2) Vibration Conformance to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
- 1 3) Impact Half sine, 11msec, 150G

8.1.18 HR-Cam SCP 21/4 G Resistant Lens f=21mm

- 1) Mount HR-Cam NAC mount (G resistant type)
 - 2) Focal length 21mm
 - 3) Maximum aperture ratio 1 : 4
 - 4) Minimum aperture F22
 - 5) Lens configuration 6 groups of 8
 - 6) Angle of view 66.96°x 52.76°(with HR-Cam Quad-VGA (full))
(horizontal x vertical) 44.91°x 34.45°(with HR-Cam SVGA)
(Calculated value) 36.59°x 27.86°(with HR-Cam VGA)
18.78°x 14.14°(with HR-Cam QVGA)
 - 7) Focusing distance 0.5m ~ ∞
 - 8) Attachment size 55mm (P=0.75mm)
 - 9) Size (lens main unit) Approximately 72mm (horizontal) x Approximately 72mm (vertical)
x Approximately 54.3mm (total length)
* The total length varies according to the focus lock position.
 - 1 0) Weight Approximately 284 g (Lens main unit : Approximately 109 g / G resistant holder : Approximately 175 g)
 - 1 1) Vibration Conformance to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
 - 1 2) Impact Half sine, 11msec, 150G
- Caution)** Replacing mount components requires focal adjustment.

8.1.19 HR-Cam SWH 15/4.5 G Resistant Lens f=15mm

- 1) Mount HR-Cam NAC mount (G resistant type)
 - 2) Focal length 15mm
 - 3) Maximum aperture ratio 1 : 4.5
 - 4) Minimum aperture F22
 - 5) Lens configuration 6 groups of 8
 - 6) Angle of view 85.59° x 69.55° (with HR-Cam Quad-VGA (full))
(horizontal x vertical) 60.11° x 46.92° (with HR-Cam SVGA)
(Calculated value) 49.69° x 38.31° (with HR-Cam VGA)
26.07° x 19.70° (with HR-Cam QVGA)
 - 7) Focusing distance 0.3m ~ ∞
 - 8) Attachment size 55mm (P=0.75mm)
 - 9) Size (lens main unit) Approximately 72mm (horizontal) x Approximately 72mm (vertical)
x 61.3mm (Total length)
* The total length varies according to the focus lock position.
 - 1 0) Weight Approximately 291 g (lens main unit : Approximately 105 g / G resistant holder : Approximately 186 g)
 - 1 1) Vibration Conformance to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
 - 1 2) Impact Half sine, 11msec, 150G
- Caution)** Replacing mount components requires focal adjustment.

8.1.20 C-Cam Tripod Plate (Side)

- 1) External dimensions Approximately W57 × H45 × D46 mm
- 2) Tripod mounting screw 1/4-20UNC (small screw) Depth8
- 3) Mounting screw hole M4 Depth8
- 4) Camera mounting screw M3 × 8

8.1.21 C-Cam Tripod Plate (Straight)

- 1) External dimensions Approximately W57 × H45 × D46 mm
- 2) Tripod mounting screw 1/4-20UNC (small screw) Depth8
- 3) Mounting screw hole M4 Depth8
- 4) Camera mounting screw M3 × 8

8.1.22 C-Cam Camera Holder (Side)

- 1) External dimensions Approximately W57 × H45 × D46 mm
- 2) Tripod mounting screw 1/4-20UNC (small screw) Depth8
- 3) Mounting screw hole M4 Depth8
- 4) Camera mounting screw M3 × 8

8.1.23 C-Cam Camera Holder (Straight)

- 1) External dimensions Approximately W57 × H45 × D46 mm
- 2) Tripod mounting screw 1/4-20UNC (small screw) Depth8
- 3) Mounting screw hole M4 Depth8
- 4) Camera mounting screw M3 × 8

<C-Cam Camera Holder option>

8.1.24 BRACKET (Angle Adjustment Fitting) (Side)

- 1) External dimensions Approximately W75 × H115 × D115 mm
- 2) Camera holder mounting screw M6 × 14 cap bolt with hexagonal hole
(attached M6 flat washer, spring washer)
- 3) Mounting hole for M10

8.1.25 BRACKET (Angle Adjustment Fitting) (Straight)

- 1) External dimensions Approximately W56 × H85 × D115 mm
- 2) Camera holder mounting screw M6 × 14 cap bolt with hexagonal hole
(attached M6 flat washer, spring washer)
- 3) Mounting hole for M10

8.1.26 Lens Holder

- 1) External dimensions Approximately W45 × H58 × D30 mm (excluding protruding parts)
- 2) Camera holder mounting screw M3 × 8
- 3) Lens
Mfg by KOWA LM3NC1M (f=3.5mm)
 LM5JC1M (f=5mm)
Mfg by RICOH FL-CC0814-2M (f=8mm)

<μ-CAM Camera option>

8.1.27 Fixing bracket, RELAY BOX

- 1) External dimensions Approximately W60 × H32 × D20 mm

8.1.28 Fixing bracket, Head Cable Connector

- 1) External dimensions Approximately W26 × H13.5 × D24 mm

8.1.29 Control Software HXLink

- | | | |
|-----|--------------------|---|
| 1) | Platform | Windows XP Professional SP3 (32bit)
Windows Vista Ultimate/Business (32/64bit)
Windows 7 Ultimate/ Professional (32/64bit)
Windows 8 Pro (32/64bit)
DirectX 8.0 or higher |
| 2) | Compatible cameras | MEMRECAM fx/GX/HX/Q1 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, TIFF (COLOR 24bit / B/W 8bit) |
| 5) | Output image files | MCFF, AVI, JPG, BMP
TIFF (COLOR 24bit、 48bit/ B/W 8bit、 16bit) |
| 6) | Other files | FCV(conversion settings), TXT(scene information),
CSV(analog waves, measurement data) |

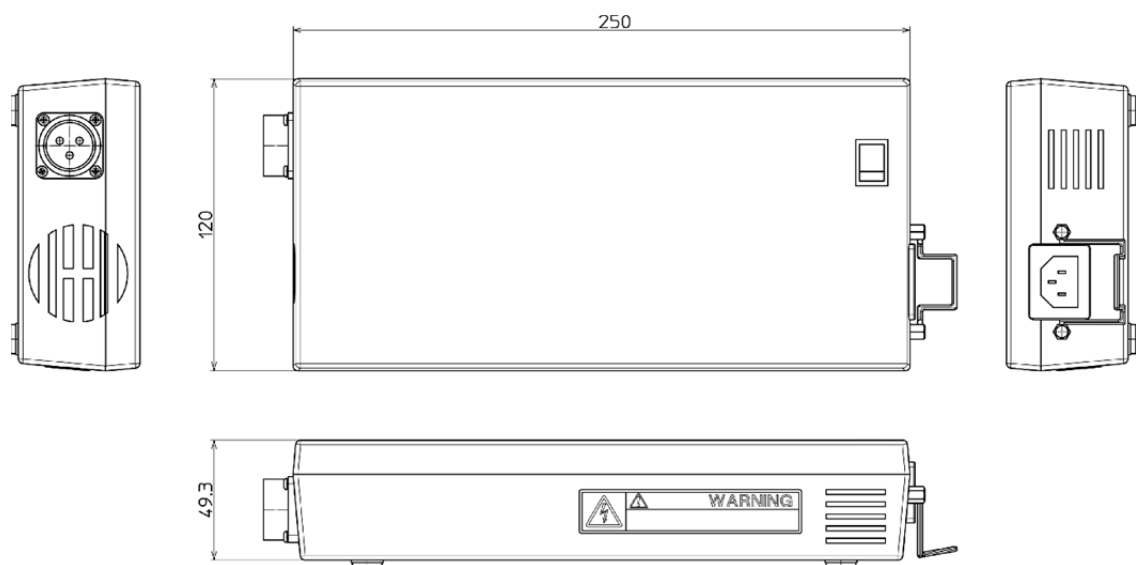
The recording information can be superimposed on the conversion image. When the pixel count is small and the superimposed character size is the following conditions, the superimposed recording information can add outside of the image area.

Large : Vertical line 408 or less, Medium : Vertical line 432 or less, Small : Vertical line 448 or less

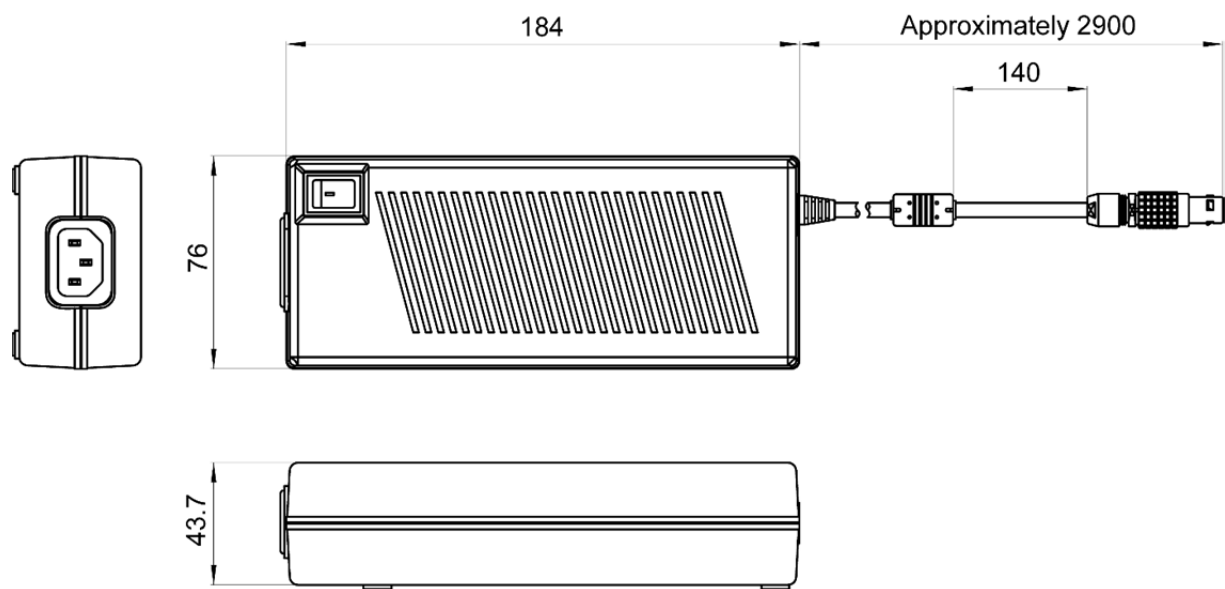
Note) The optional external signal storage unit is required for analog waveforms

8.2 Exterior Diagram

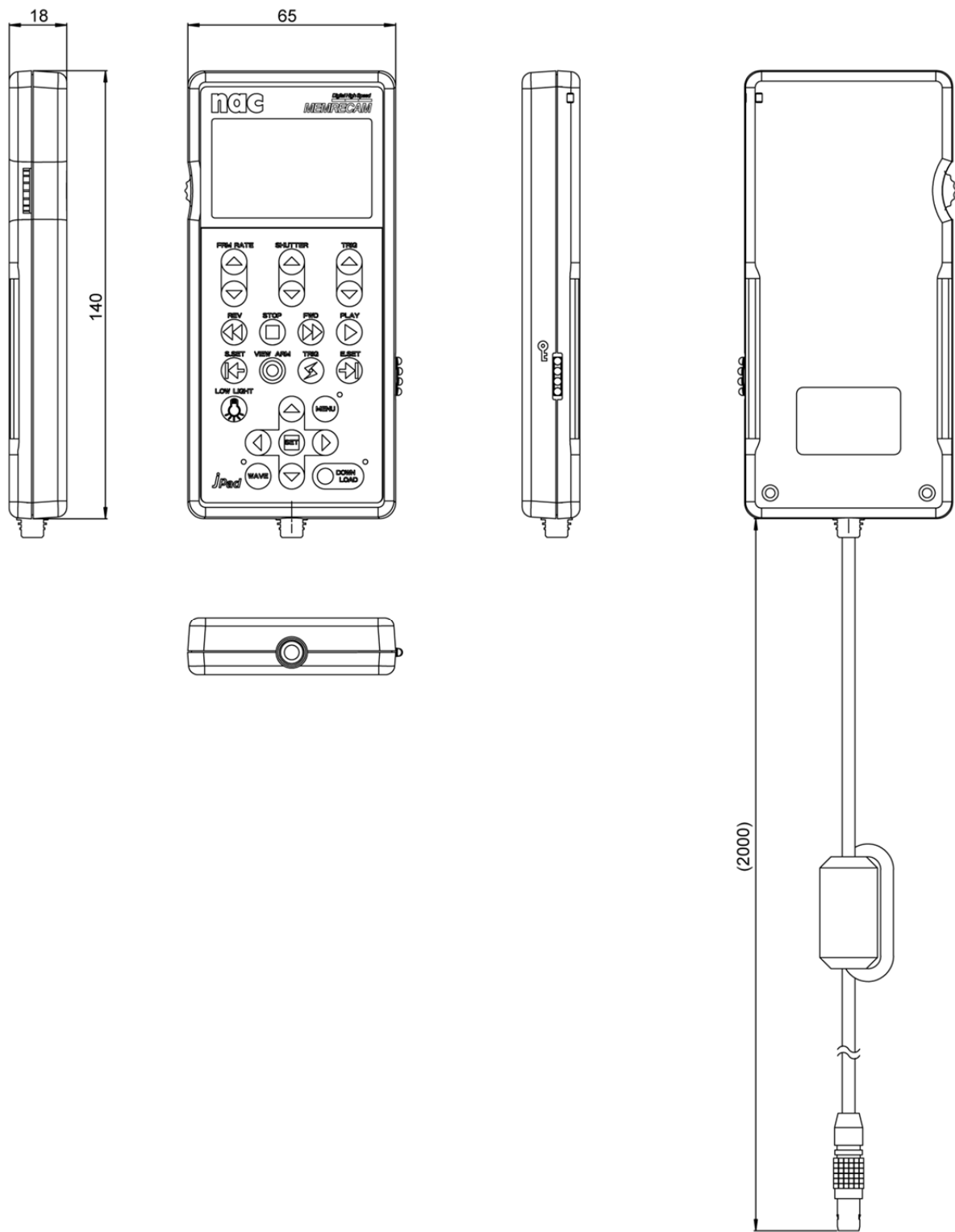
8.2.1 AC adapter for GX-5 8ch DRP



8.2.2 AC adapter for GX-5 4ch DRP

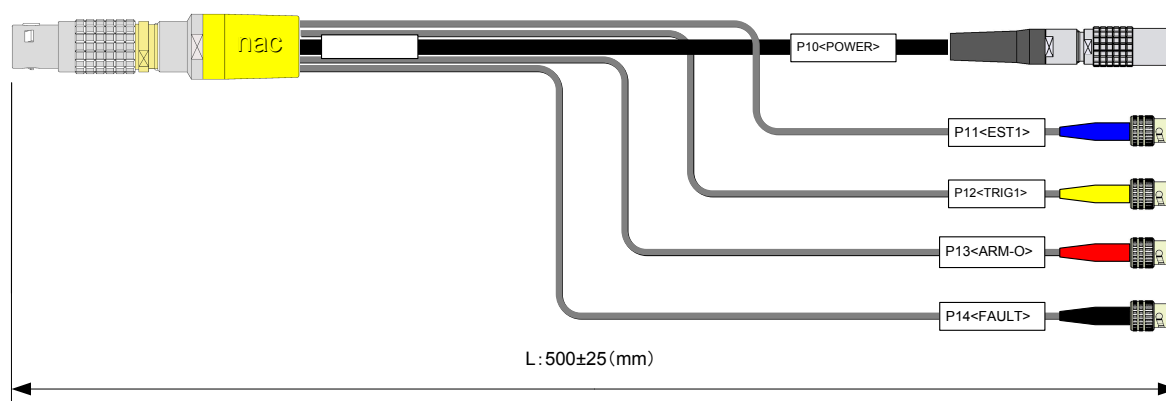


8.2.3 J-PAD3

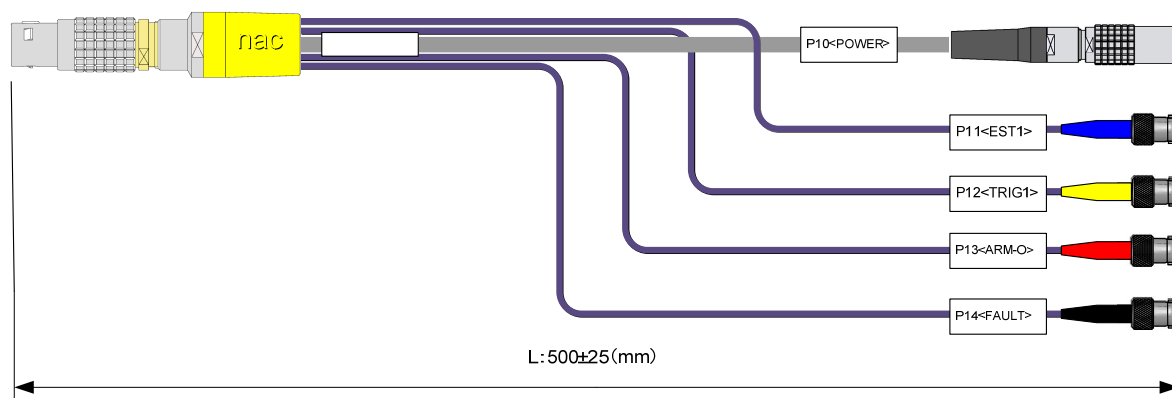


8.2.4 Cables

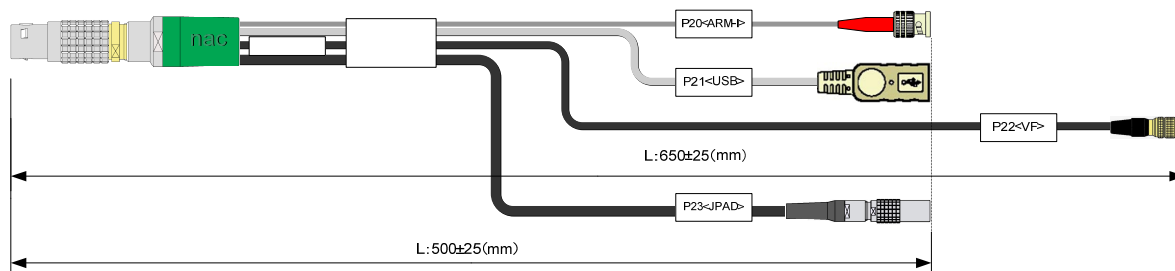
1) J1 Split Cable (BNC plug)



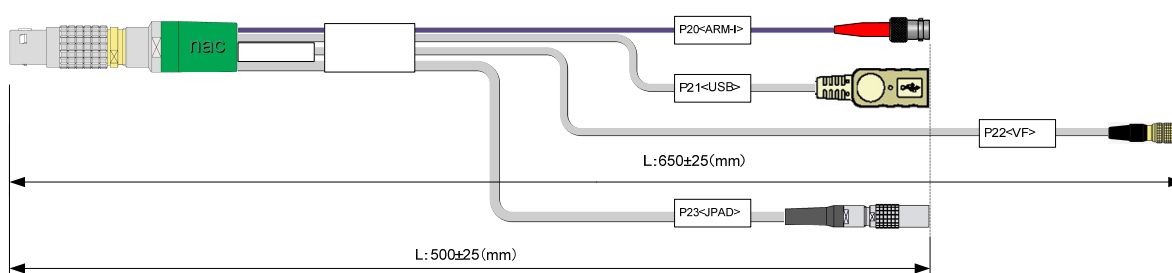
2) J1 Split Cable (BNC receptacle)



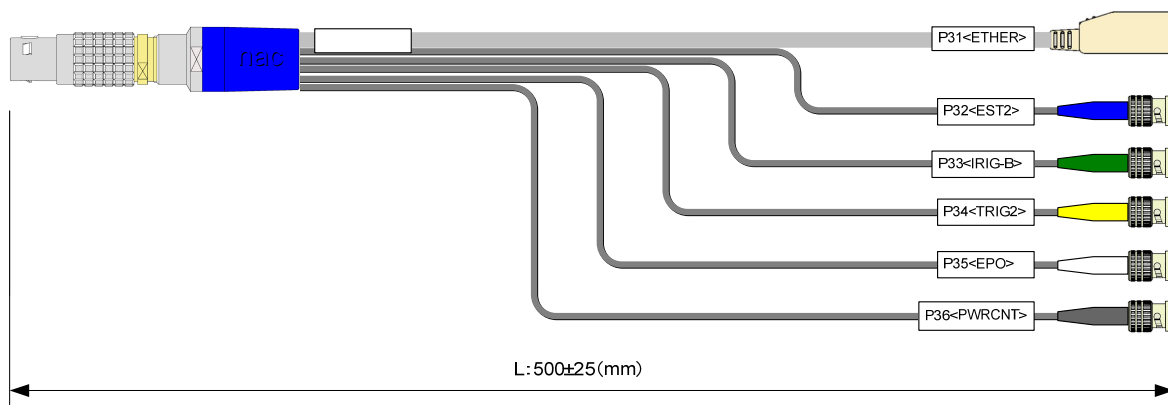
3) J2 Split Cable (BNC plug)



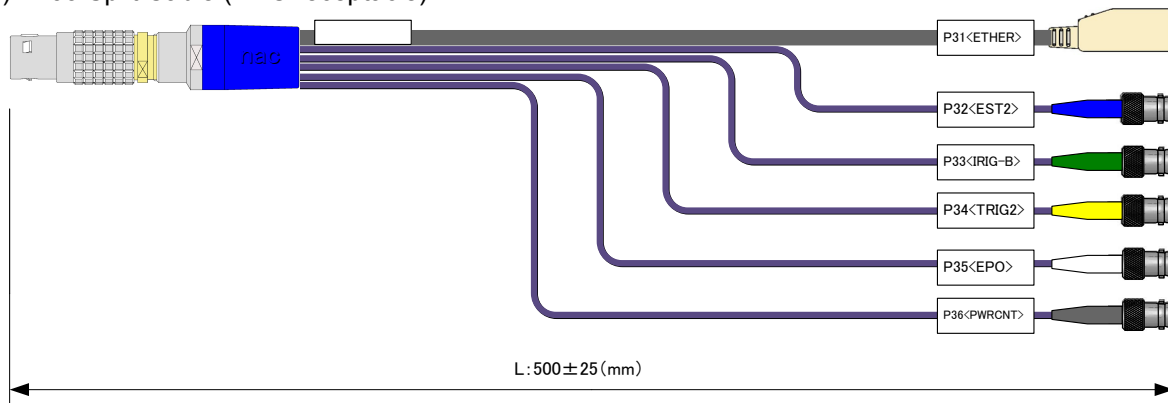
4) J2 Split Cable (BNC receptacle)



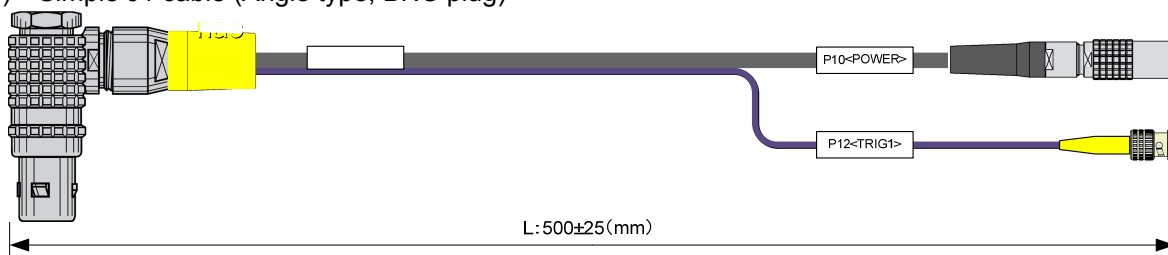
5) J3 Split Cable (BNC plug)



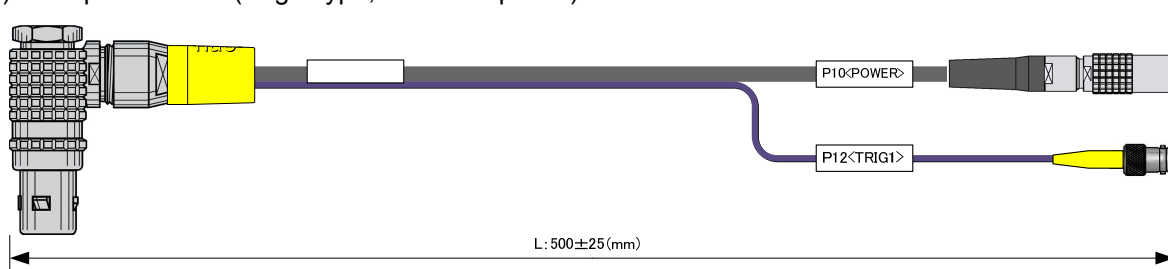
6) J3 Split Cable (BNC receptacle)



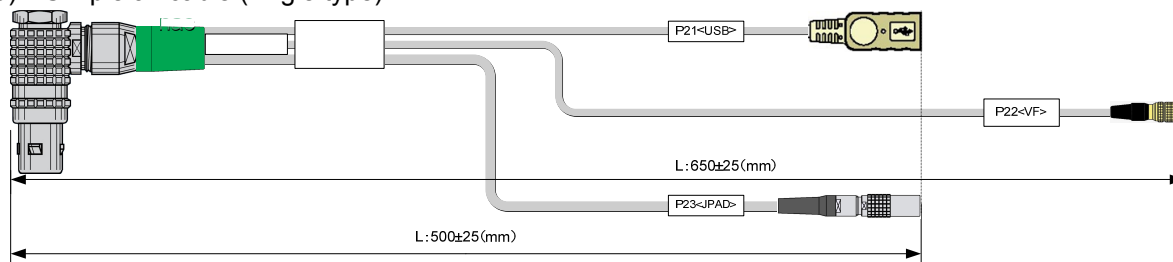
7) Simple J1 cable (Angle type, BNC plug)



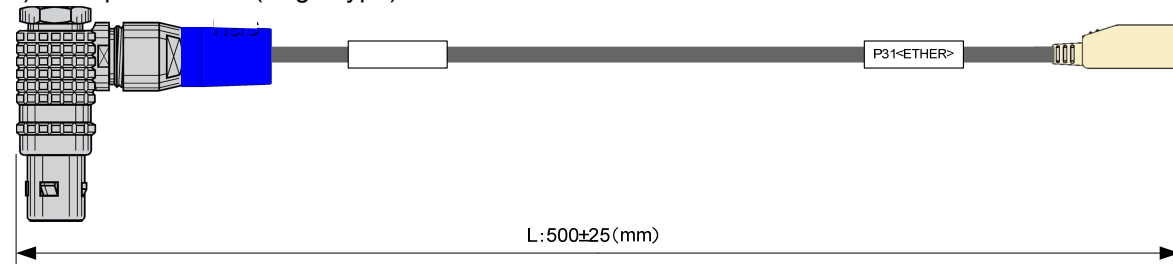
8) Simple J1 cable (Angle type, BNC receptacle)



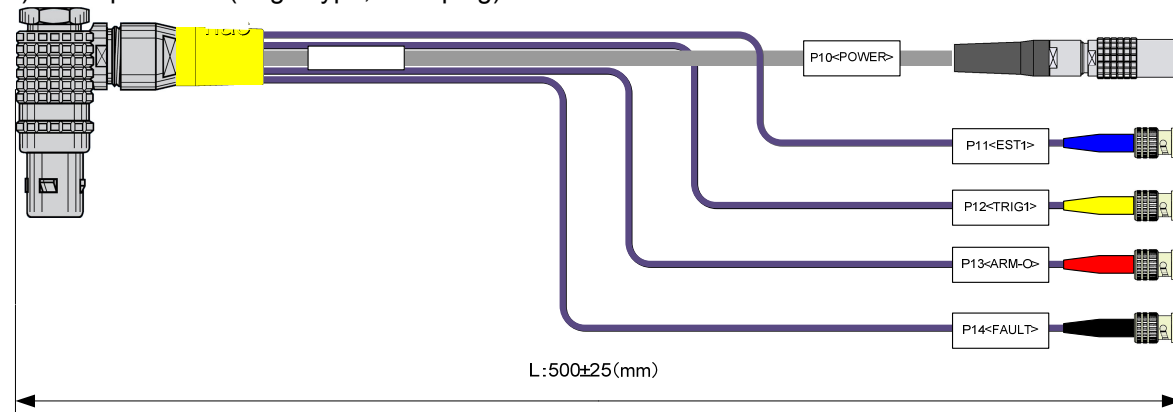
9) Simple J2 cable (Angle type)



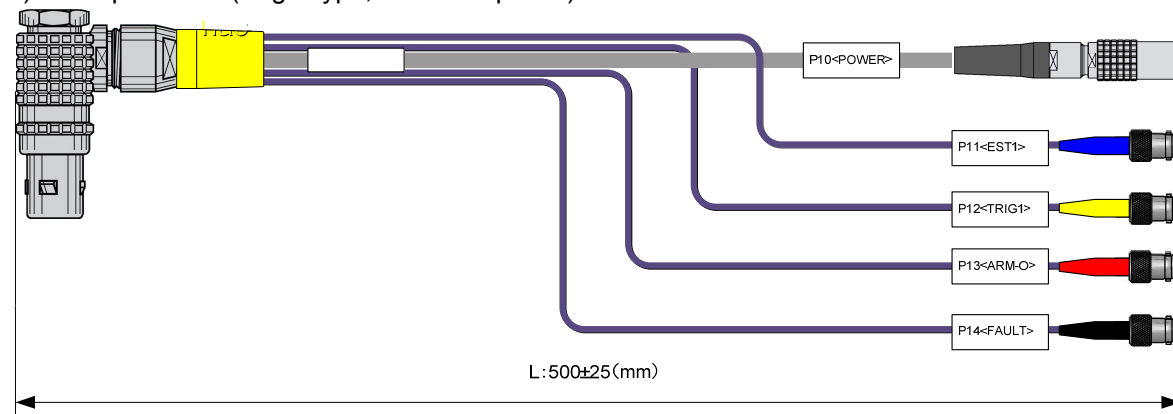
10) Simple J3 cable (Angle type)



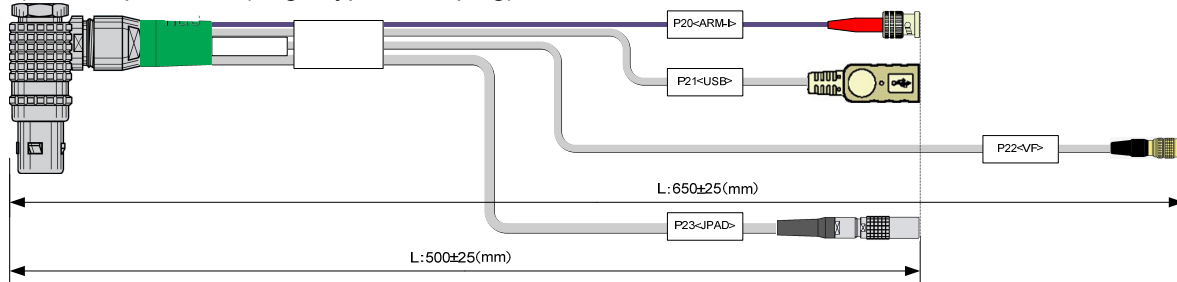
11) J1 Split Cable (Angle type, BNC plug)



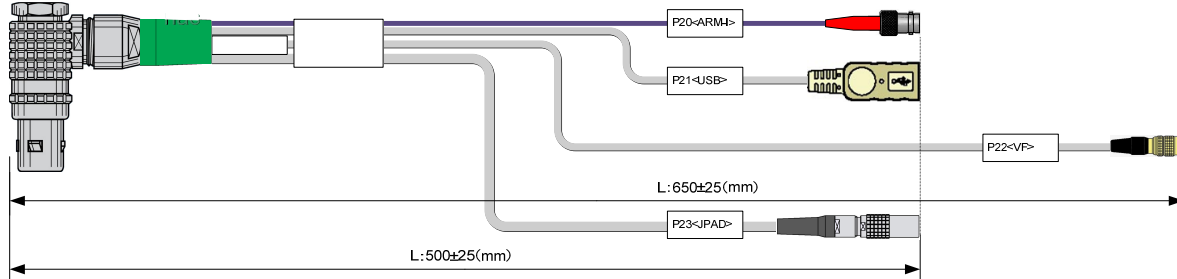
12) J1 Split Cable (Angle type, BNC receptacle)



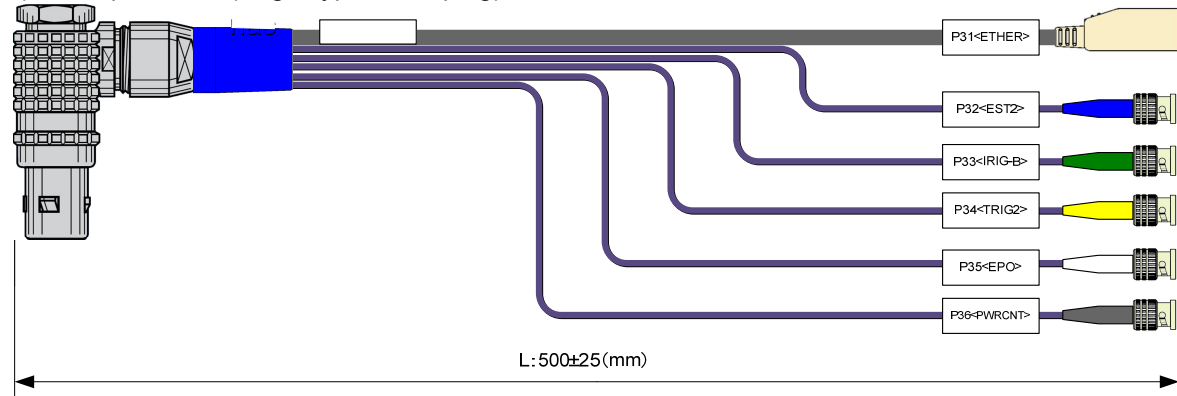
13) J2 Split Cable (Angle type, BNC plug)



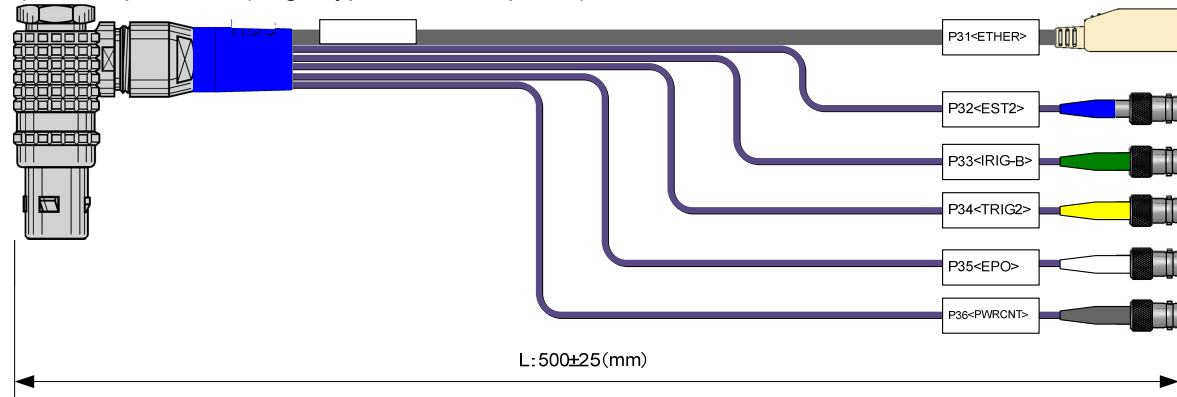
14) J2 Split Cable (Angle type, BNC receptacle)



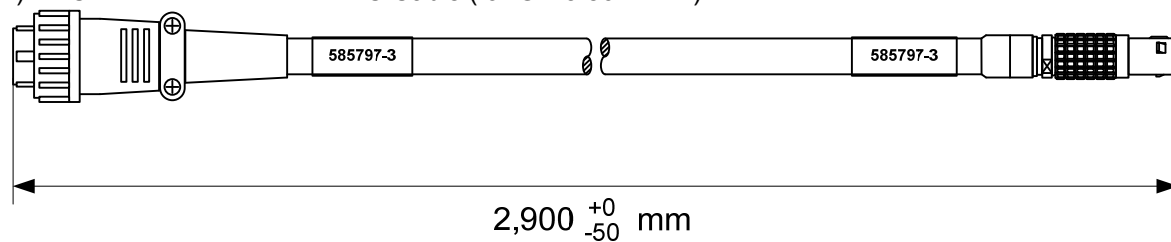
15) J3 Split Cable (Angle type, BNC plug)



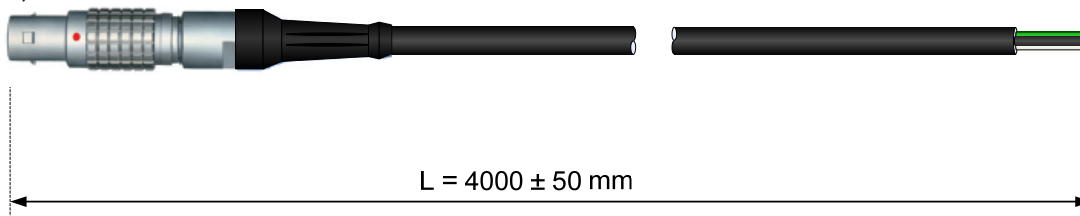
16) J3 Split Cable (Angle type, BNC receptacle)



17) AC ADAPTER – DRP DC Cable (for GX-5 8ch DRP)



18) DRP DC cable



19) HR Cam CABLE (Straight type)



Table of the cable length

No	Cable length: L
584809-3	3m ± 0.03m
584809-4	4m ± 0.04m
584809-5	5m ± 0.05m

20) HR-A Cam CABLE (Angle type)

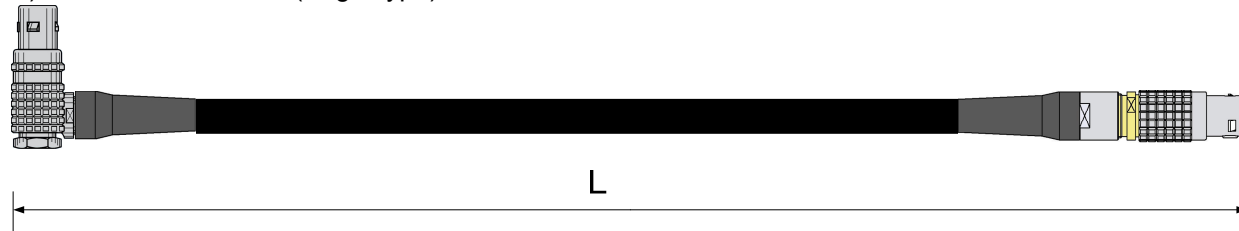


Table of the cable length

No	Cable length: L
584830-3	3m ± 0.03m
584830-4	4m ± 0.04m

21) Camera Extension Cable (Straight type)

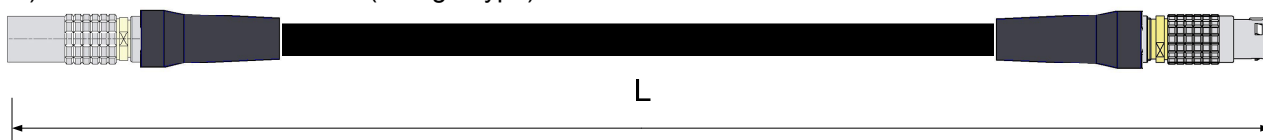


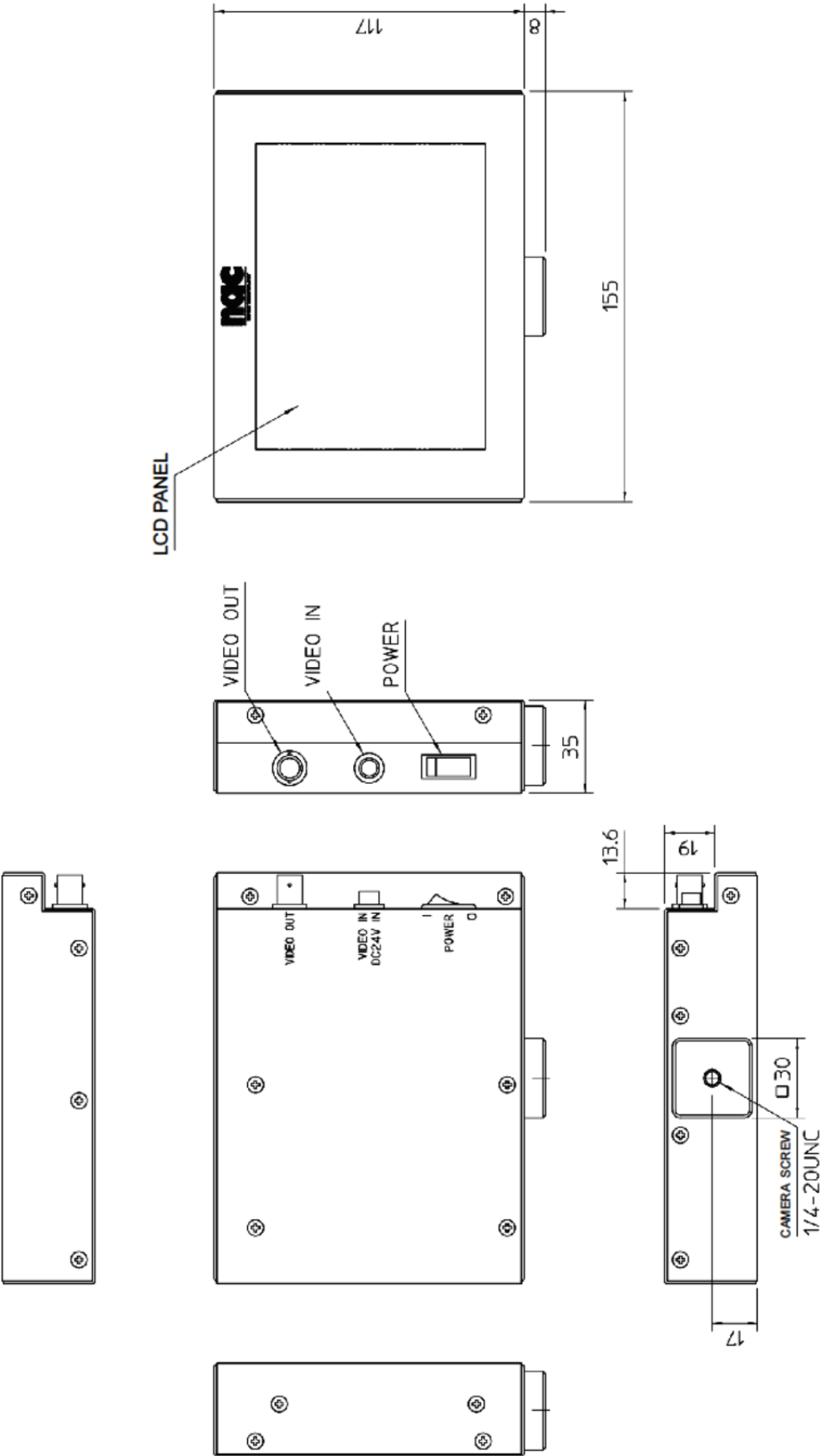
Table of the cable length
(ODU)

No	Cable length: L
584621--	4m ± 0.04m
584621-6	6m ± 0.06m
584621-8	8m ± 0.08m

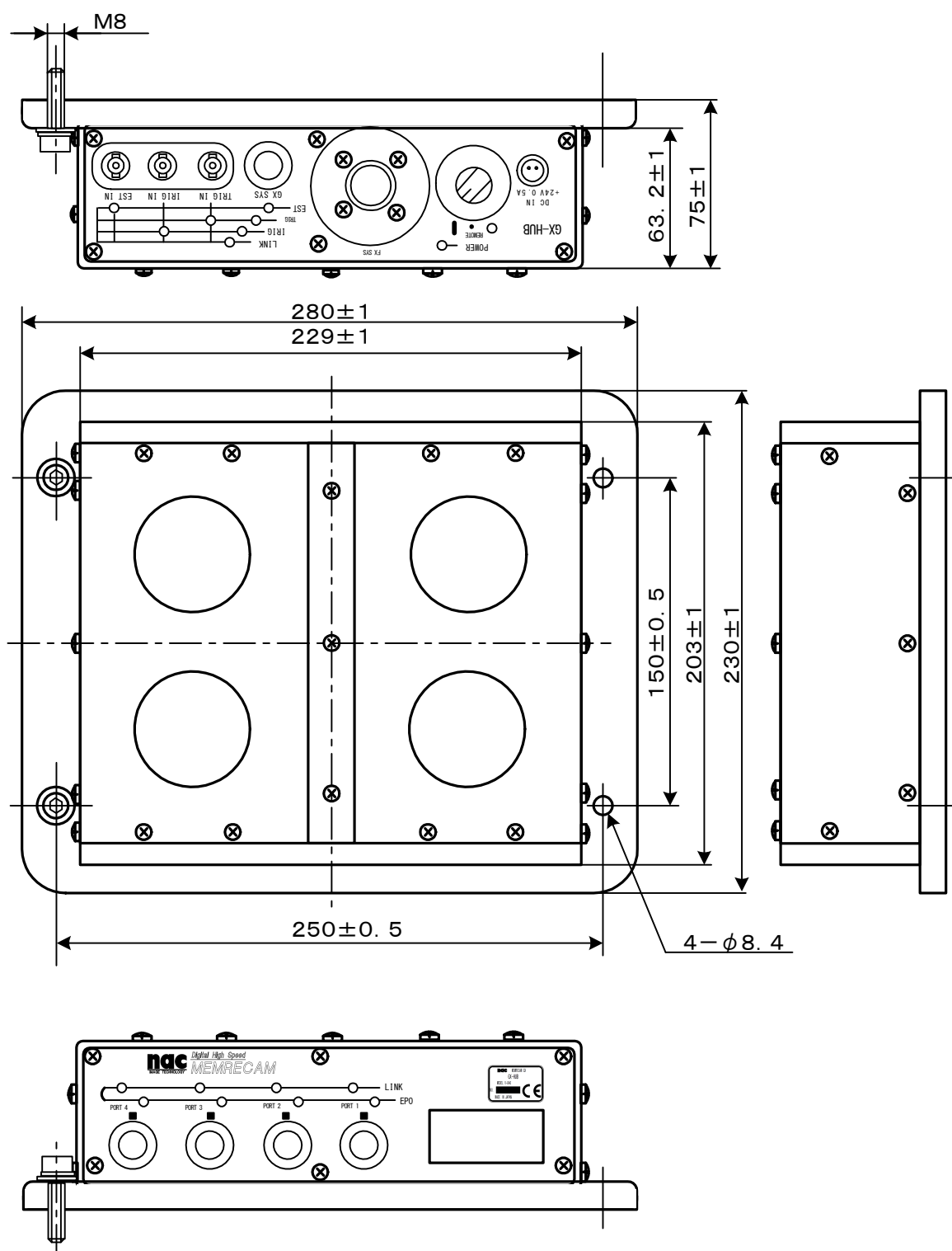
Table of the cable length
(LEMO)

No	Cable length: L
586342-4	4m ± 0.04m
586342-6	6m ± 0.06m
586342-8	8m ± 0.08m

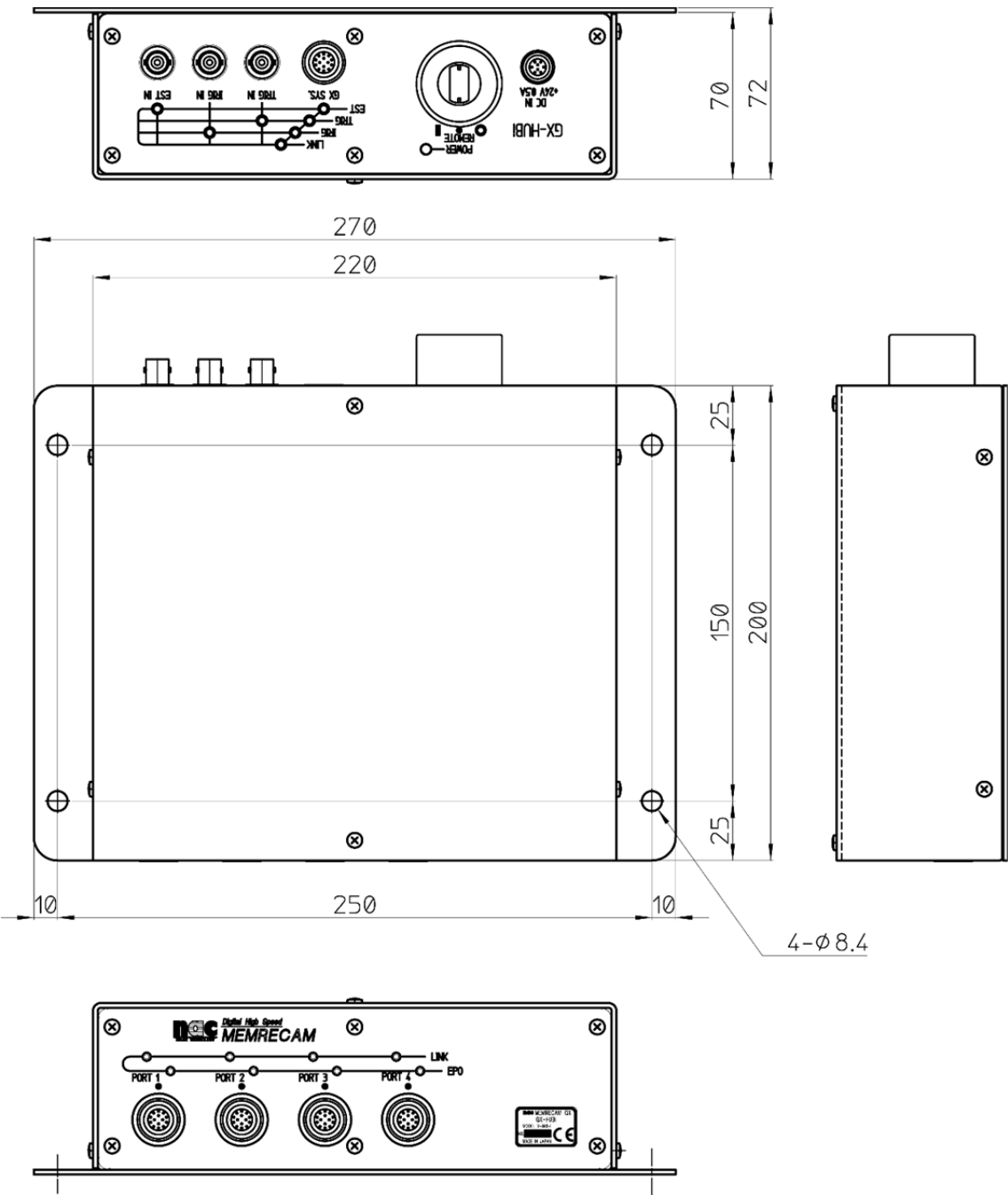
8.2.5 5.7 inch LCD Viewfinder



8.2.6 GX-HUB



8.2.7 GX-HUBi (Non G Resistant Model、No FX SYS Connector)



8.2.8 GX Remote Cable (Male-Female)

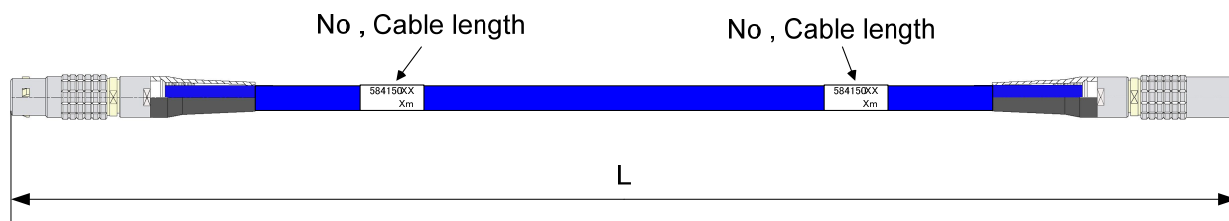


Table of the cable length

No	Cable length: L	No	Cable length: L
584150-3	3m±0.03m	584150-8	25m±0.25m
584150-4	5m±0.05m	584150-9	35m±0.35m
584150-5	7.5m±0.08m	584150X0	50m±0.5m
584150-6	10m±0.1m	584150X1	75m±0.75m
584150-7	15m±0.15m	584150X2	100m±1.0m

8.2.9 GX Remote Cable (Male-Male) : For GX-HUBi

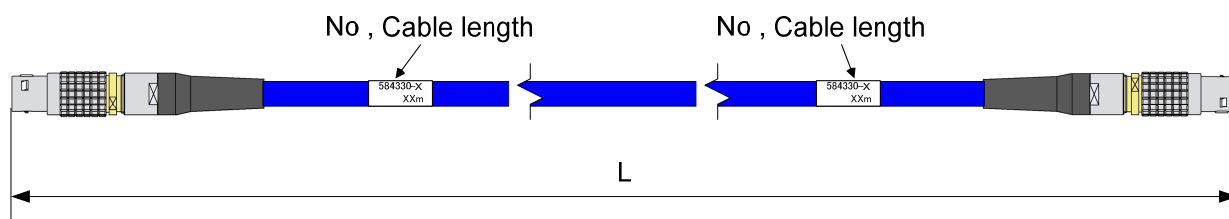
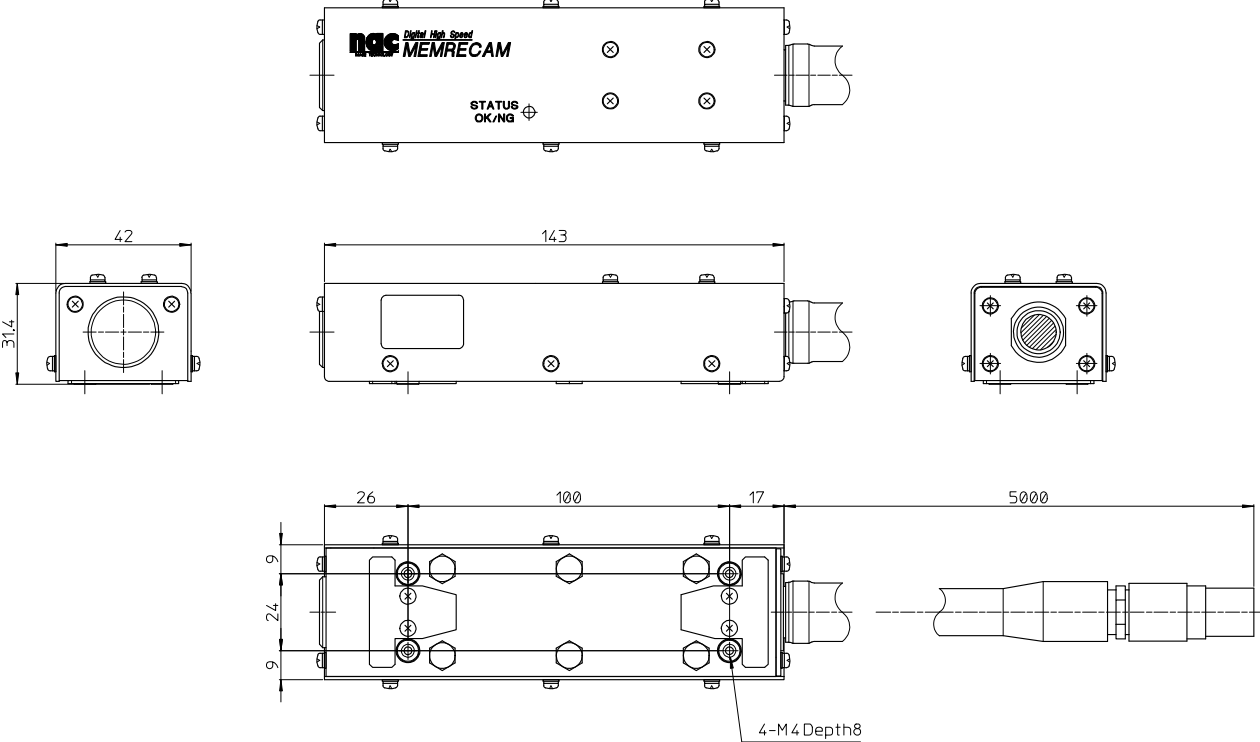


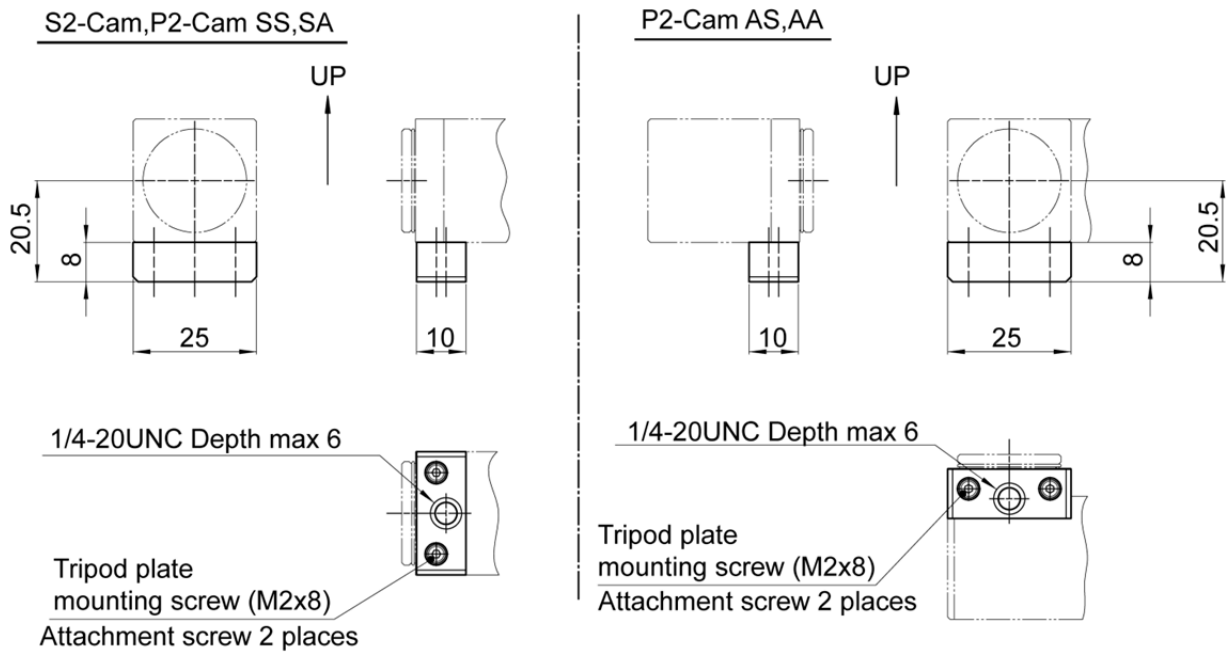
Table of the cable length

No	Cable length: L	No	Cable length: L	No	Cable length: L
584330-1	10m±0.1m	584330-9	90m±0.9m	584330X7	65m±0.65m
584330-2	20m±0.2m	584330-0	100m±1.0m	584330X8	75m±0.75m
584330-3	30m±0.3m	584330X1	5m±0.05m	584330X9	85m±0.85m
584330-4	40m±0.4m	584330X2	15m±0.15m	584330X0	95m±0.95m
584330-5	50m±0.5m	584330X3	25m±0.25m	584330Y1	7.5m±0.08m
584330-6	60m±0.6m	584330X4	35m±0.35m	584330Y2	3m±0.05m
584330-7	70m±0.7m	584330X5	45m±0.45m	584330Y3	1.5m±0.05m
584330-8	80m±0.8m	584330X6	55m±0.55m		

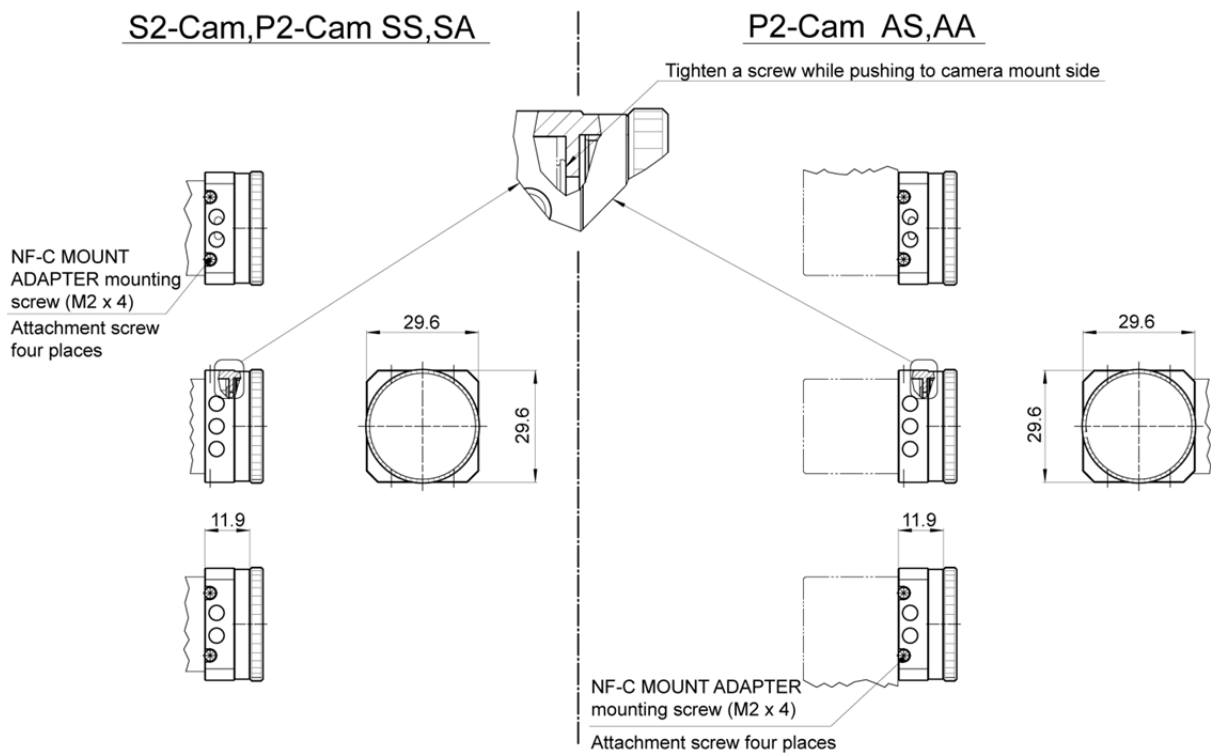
8.2.10 BB1 UNIT (G-resistant model)



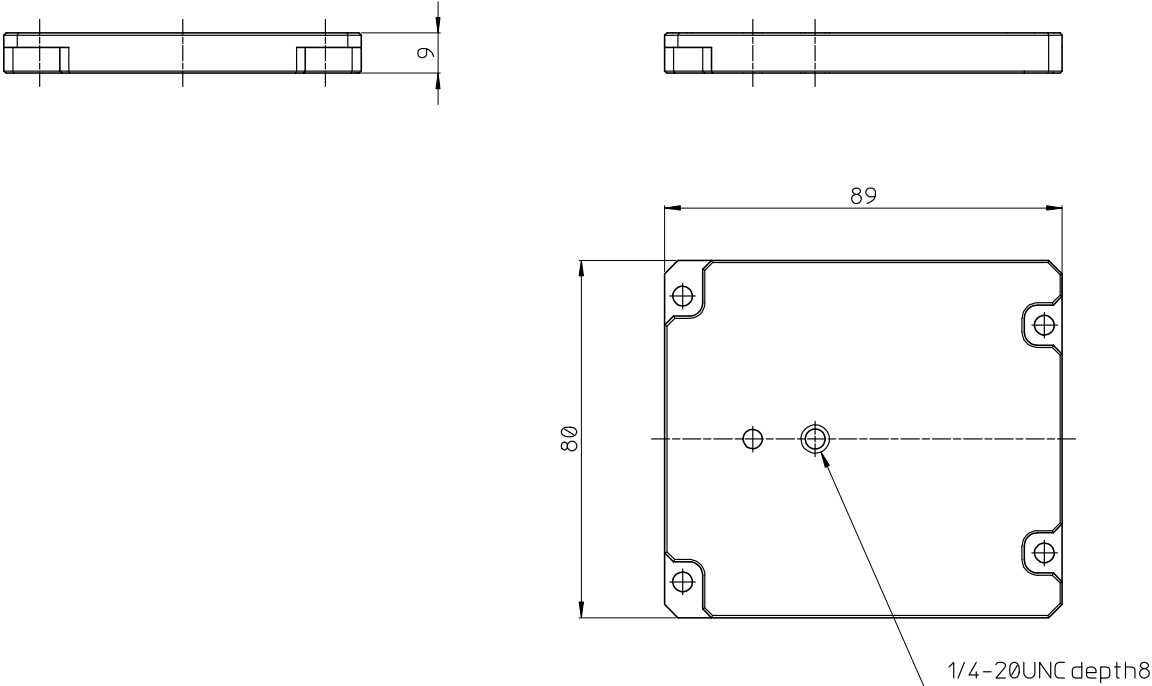
8.2.11 P2-Cam, S2-Cam Tripod Plate



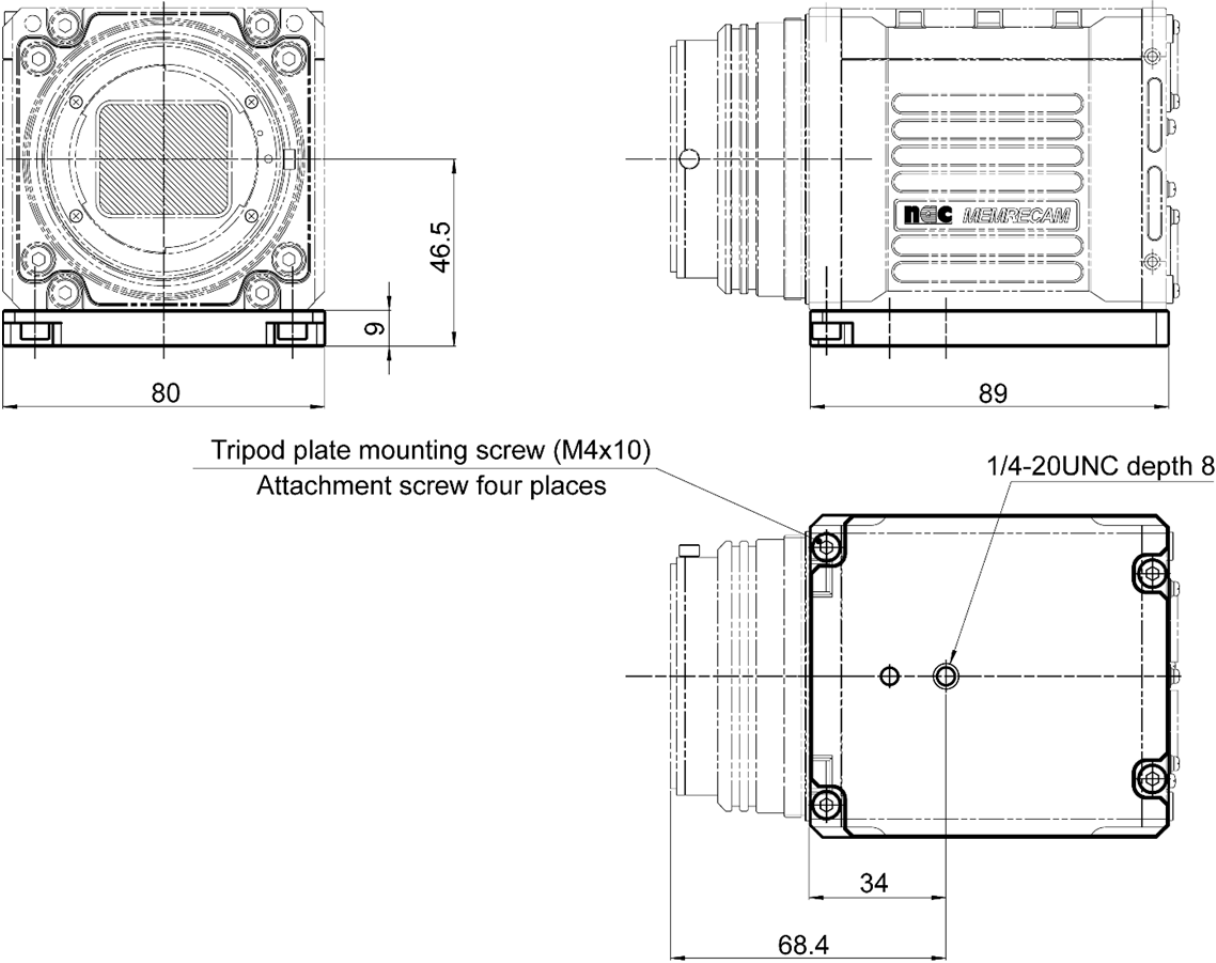
8.2.12 NF-C Mount Adapter (exclusive to P2-Cam, S2-Cam)



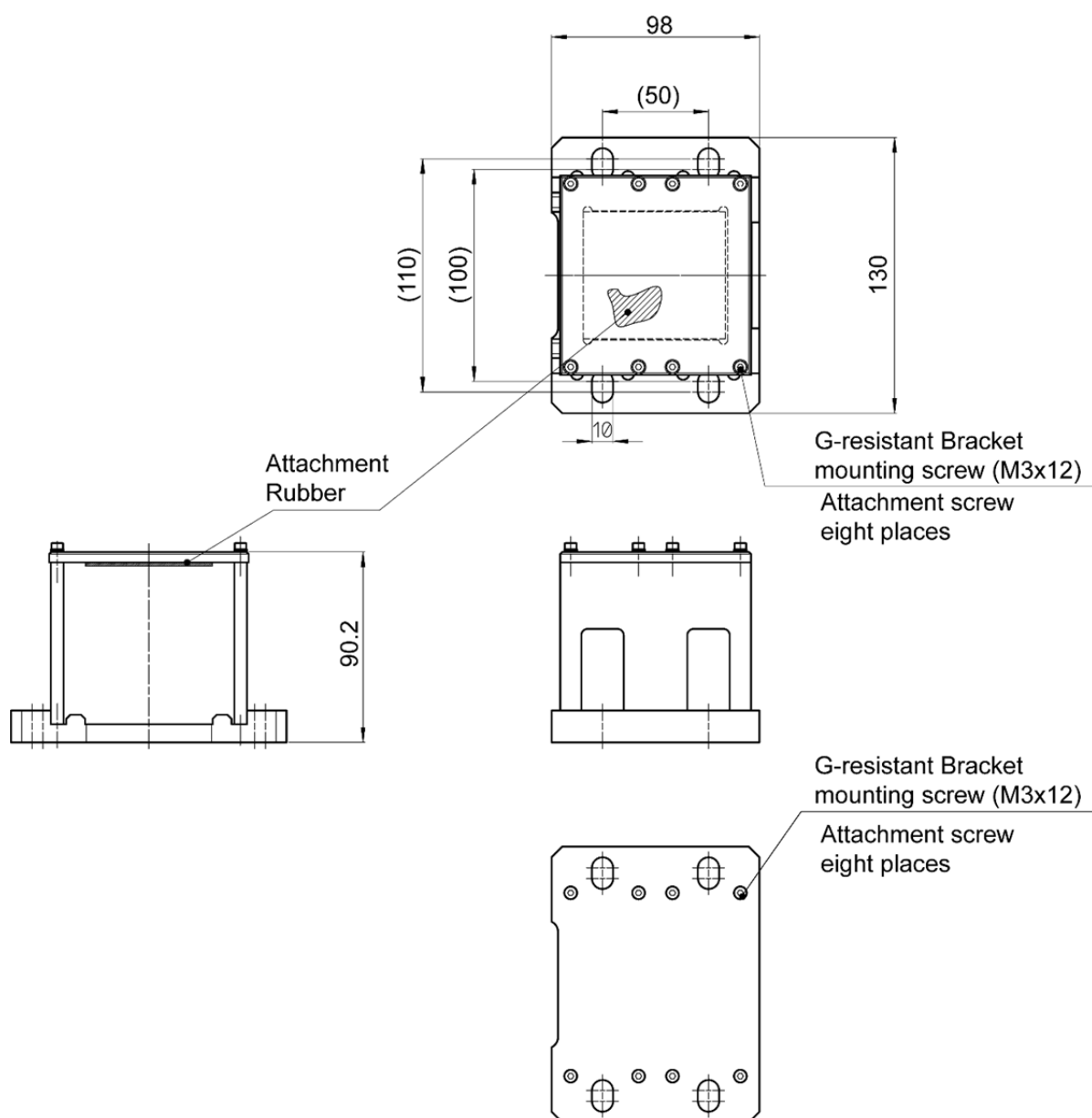
8.2.13 HR-Cam Tripod Plate



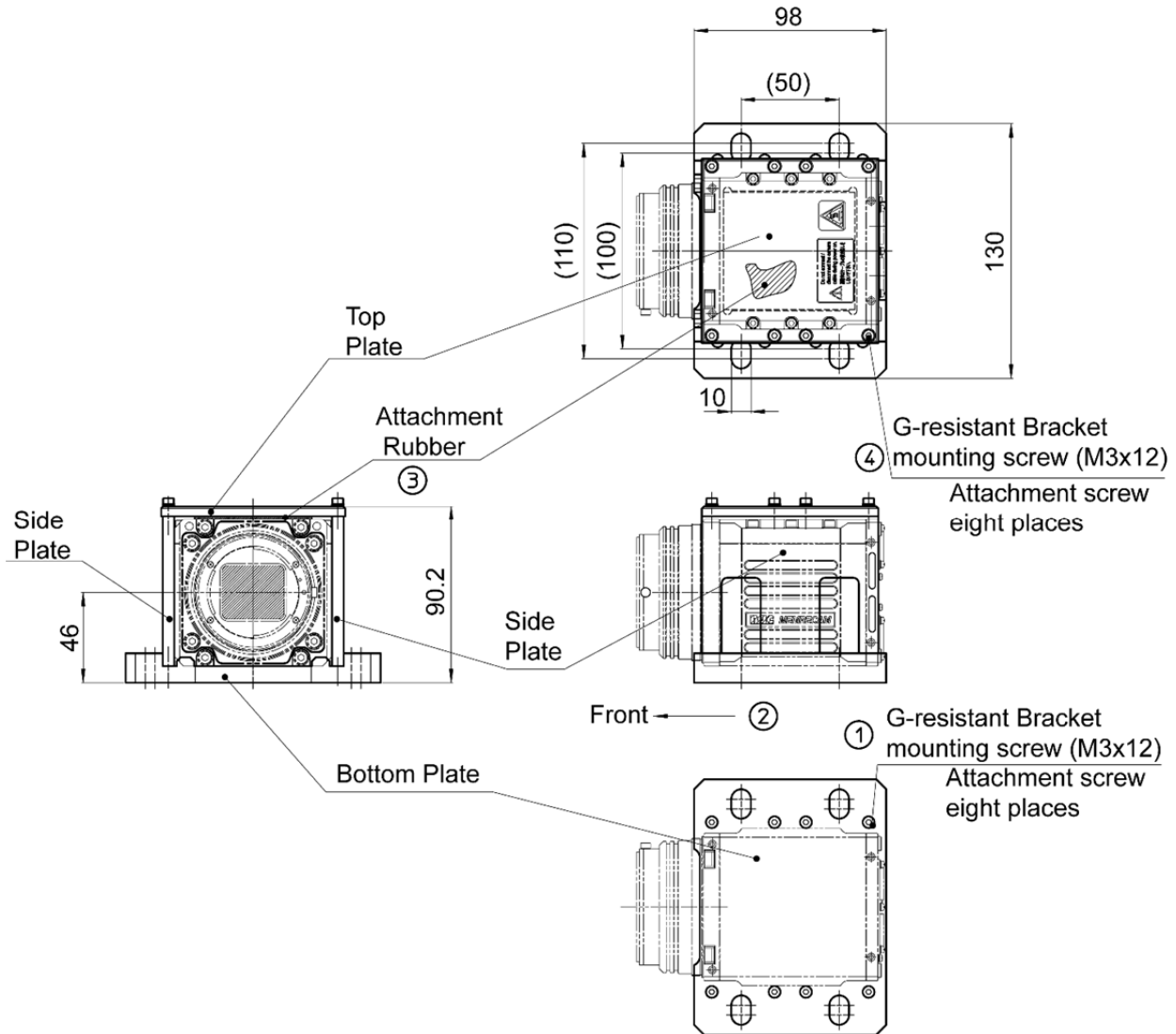
8.2.13.1 Tripod Plate Attachment



8.2.14 HR-Cam G Resistant Bracket



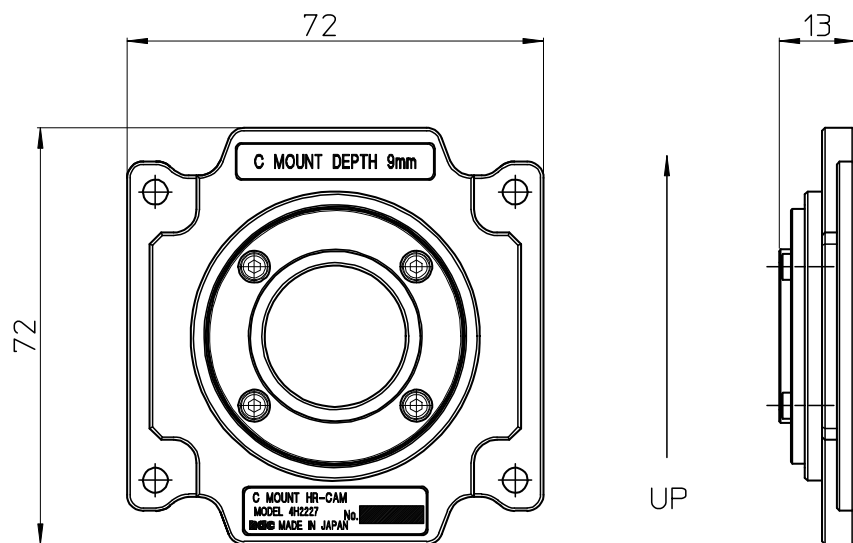
8.2.14.1 G Resistant Bracket Attachment



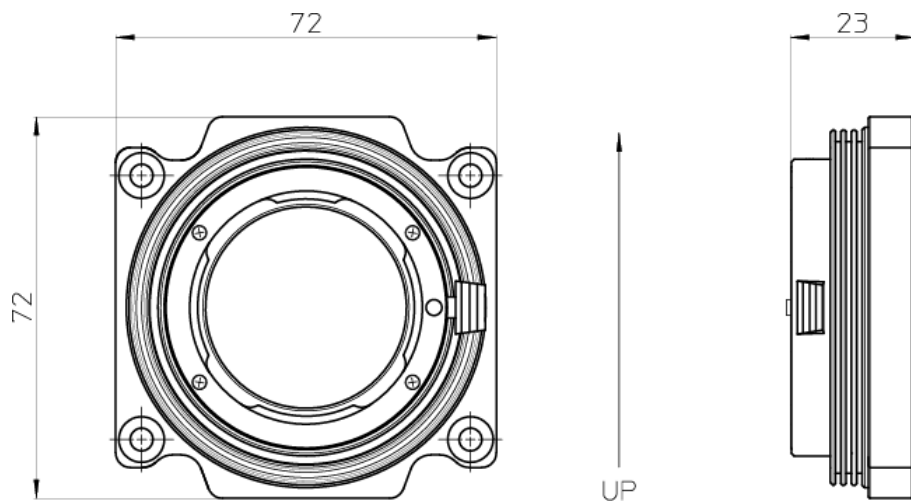
- ① Two side plates (right and left) are fixed to the bottom plate by tightening the screw.
- ② The main body of camera is placed to the front detent.
- ③ The rubber is sandwiched between the main body of camera and the top plate.
- ④ Top plate is fixed by tightening the screw.

Note) Please confirm that the screw is not loose without fail before use.

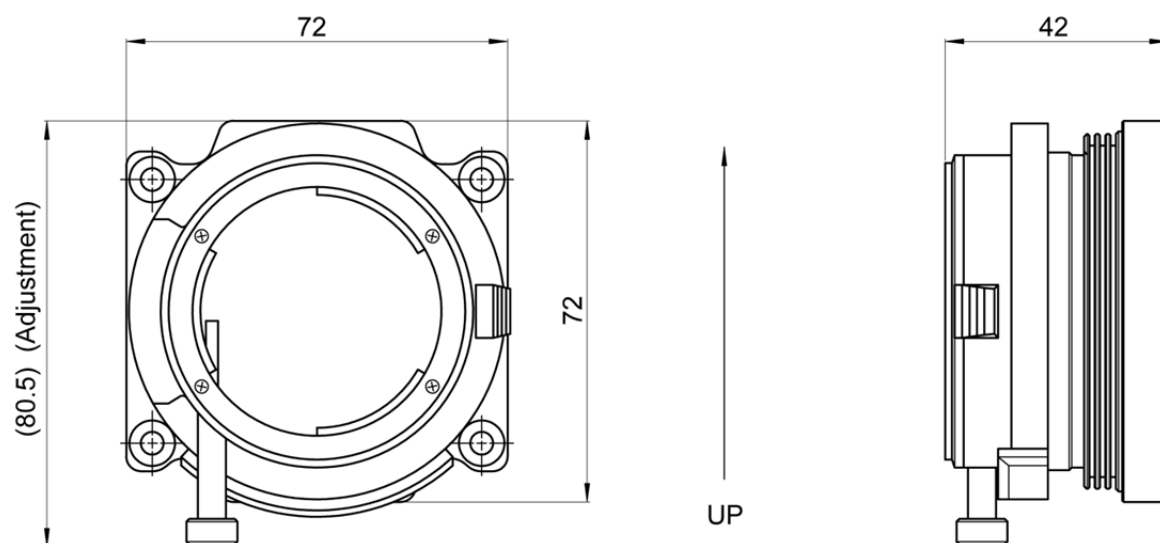
8.2.15 HR-Cam C Mount Adapter



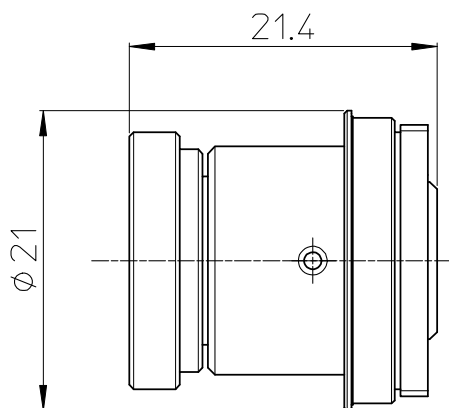
8.2.16 HR-Cam NM Mount Adapter



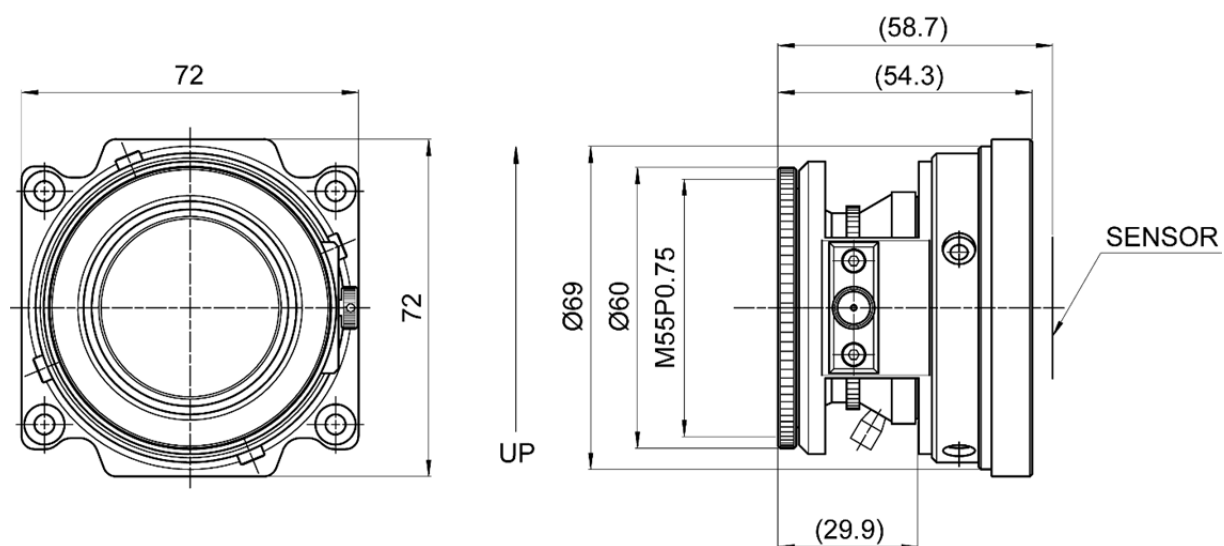
8.2.17 HR-Cam G Type F Mount Adapter



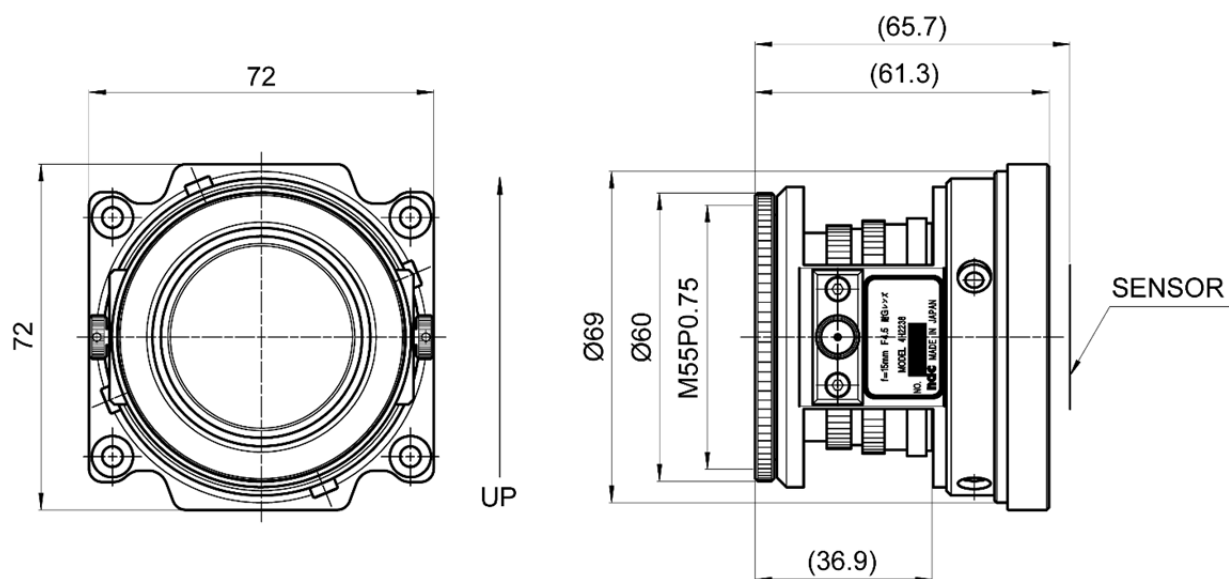
8.2.18 SPM Lens (G Resistant Model / exclusive to the P2-Cam, S2-Cam)



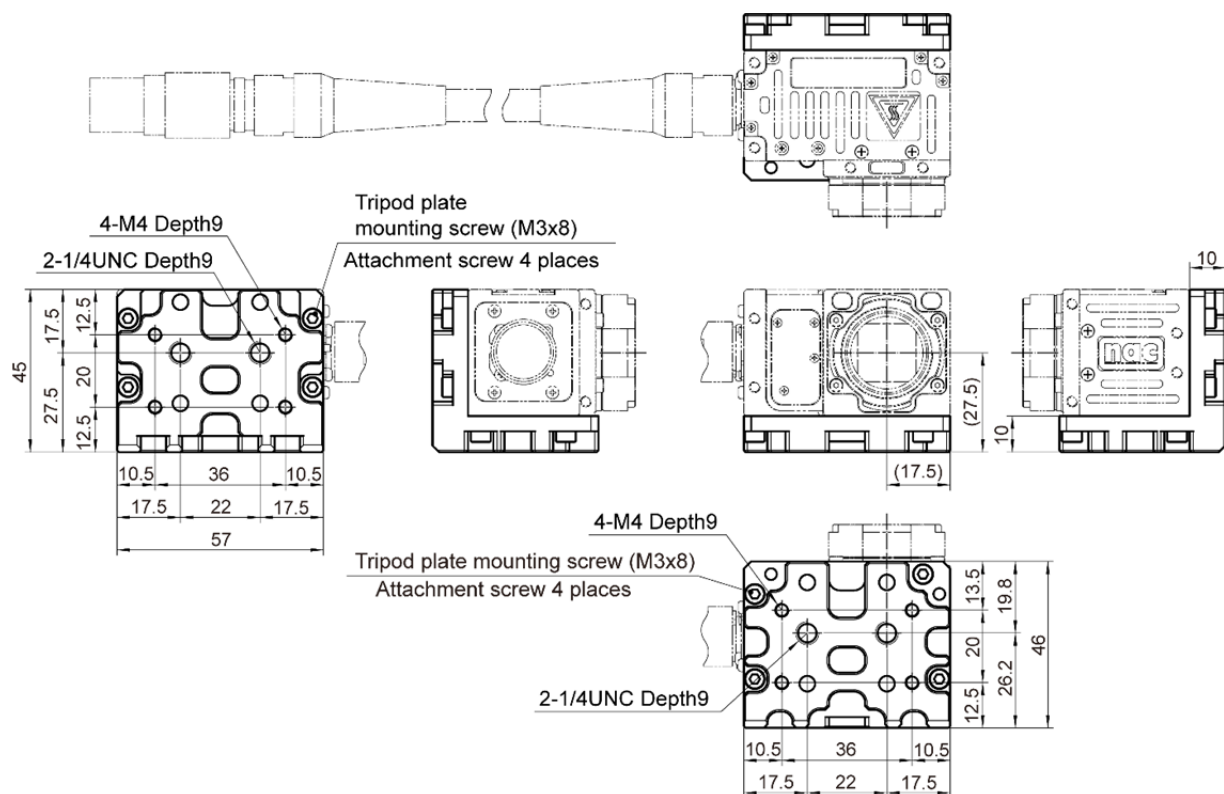
8.2.19 HR-Cam SCP 21/4 G Resistant Lens f=21mm



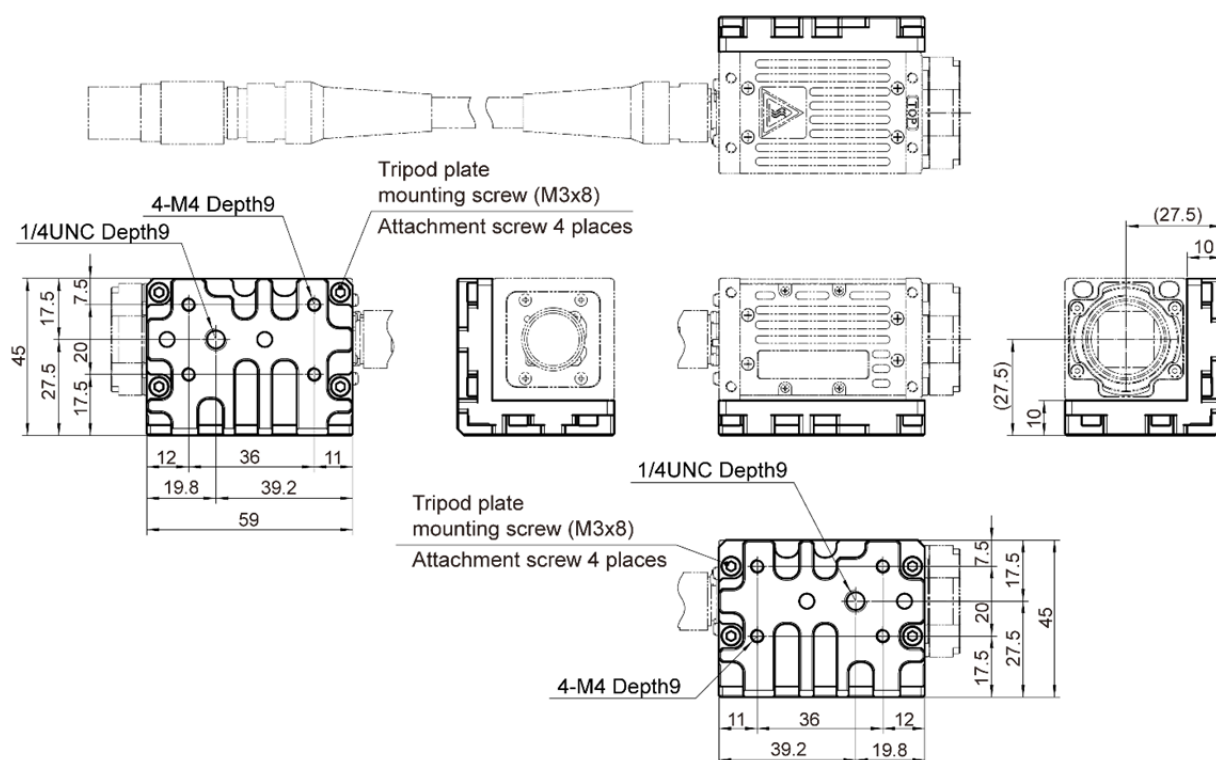
8.2.20 HR-Cam SWH 15/4.5 G Resistant Lens f=15mm



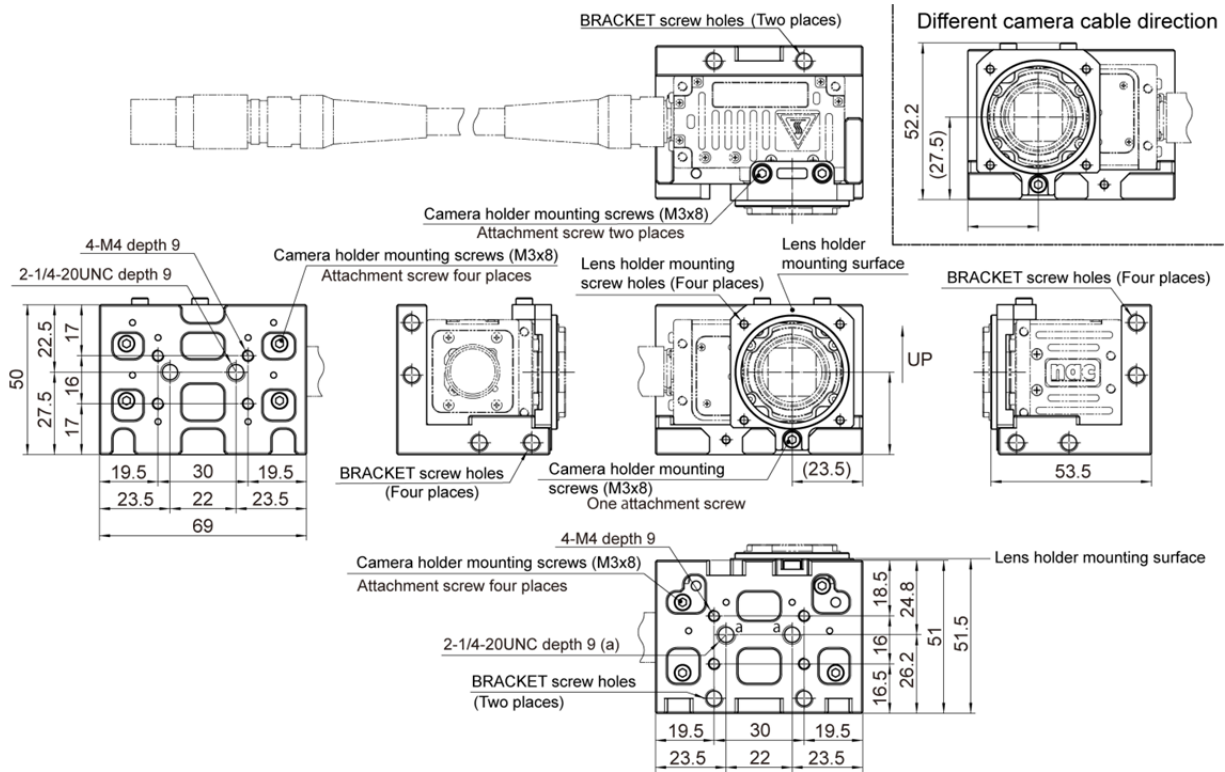
8.2.21 C-Cam Tripod Plate (Side)



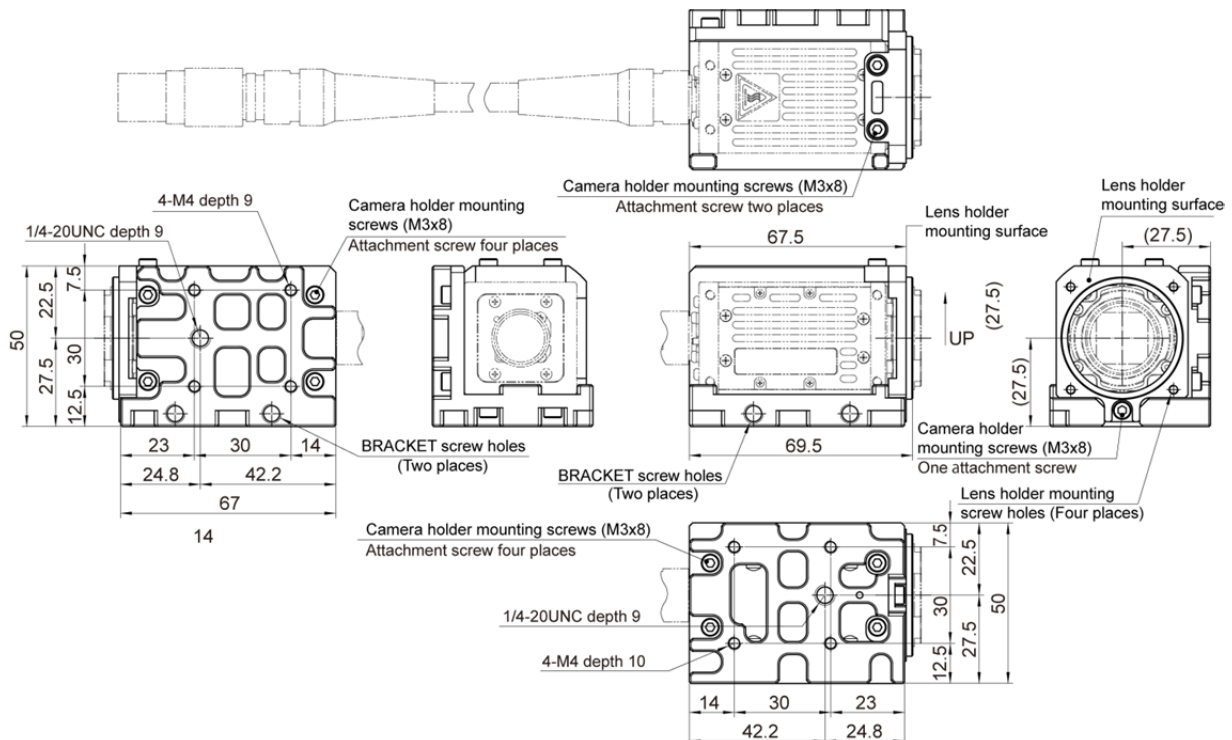
8.2.22 C-Cam Tripod Plate (Straight)



8.2.23 C-Cam Camera Holder (Side)

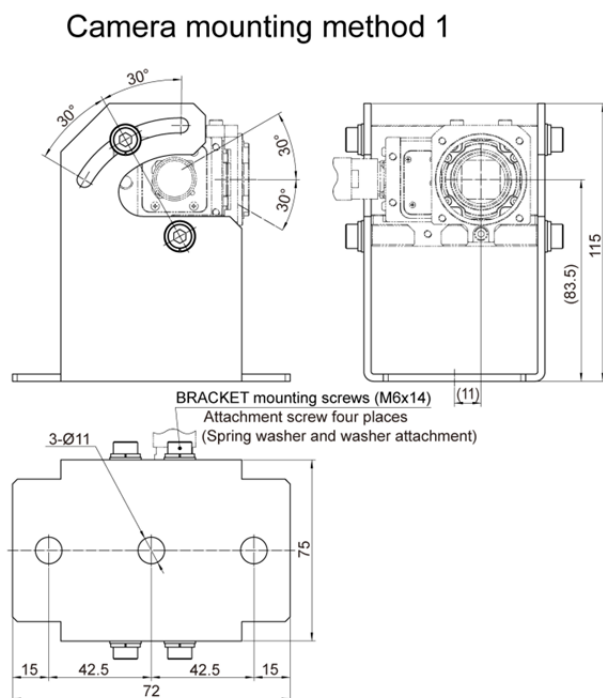


8.2.24 C-Cam Camera Holder (Straight)

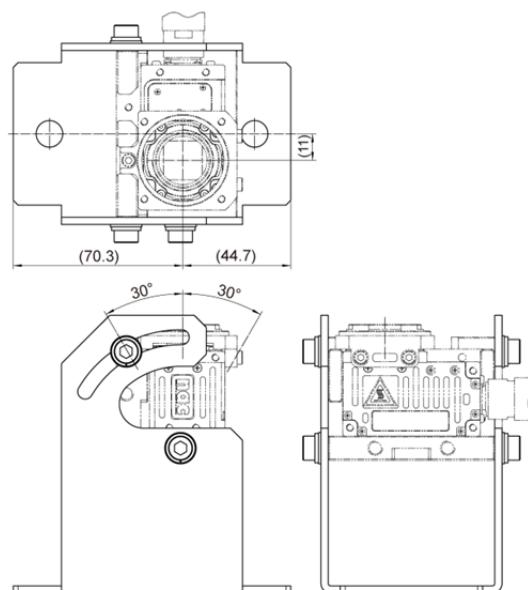


<C-Cam G Resistant Camera Holder Options>

8.2.25 BRACKET (Side)

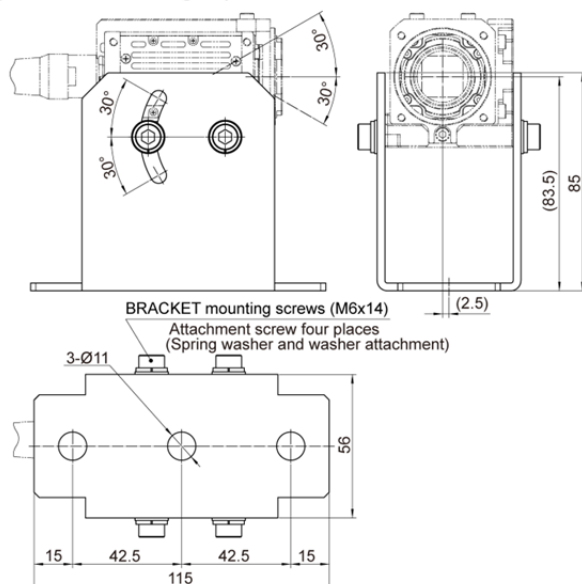


Camera mounting method 2

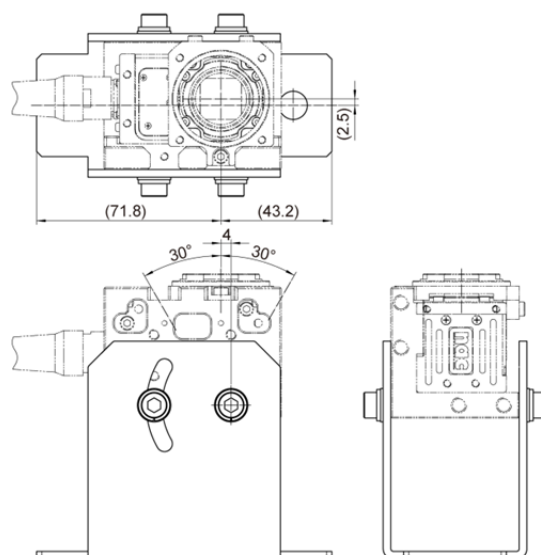


8.2.26 BRACKET (Used for Straight and Side)

Camera mounting method 1 (C-Cam Straight)

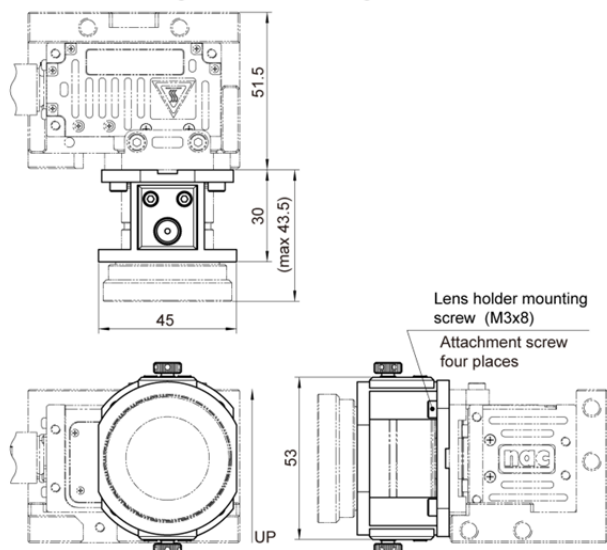


Camera mounting method 2 (C-Cam Side)

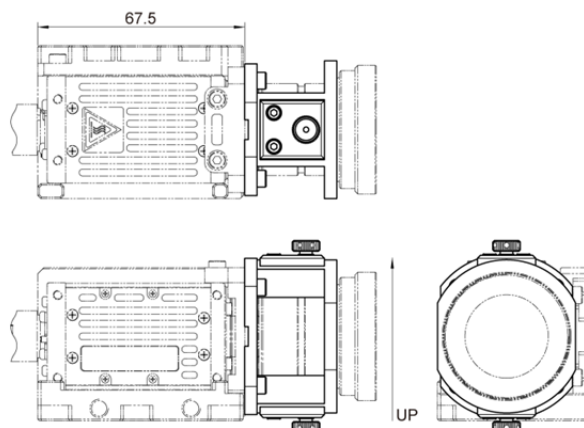


8.2.27 C-Cam Lens Holder (Both Side/Straight)

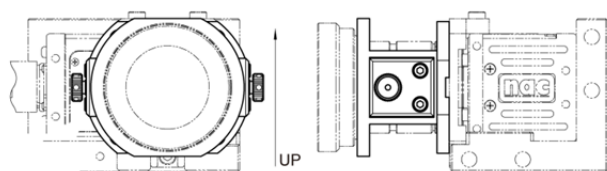
C-Cam Side figure of mounting 1



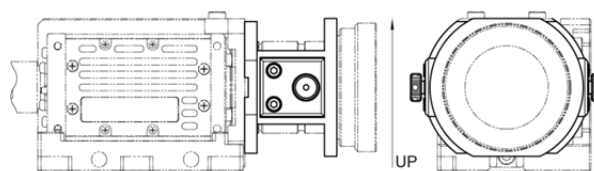
C-Cam Straight figure of mounting 1



C-Cam Side figure of mounting 2

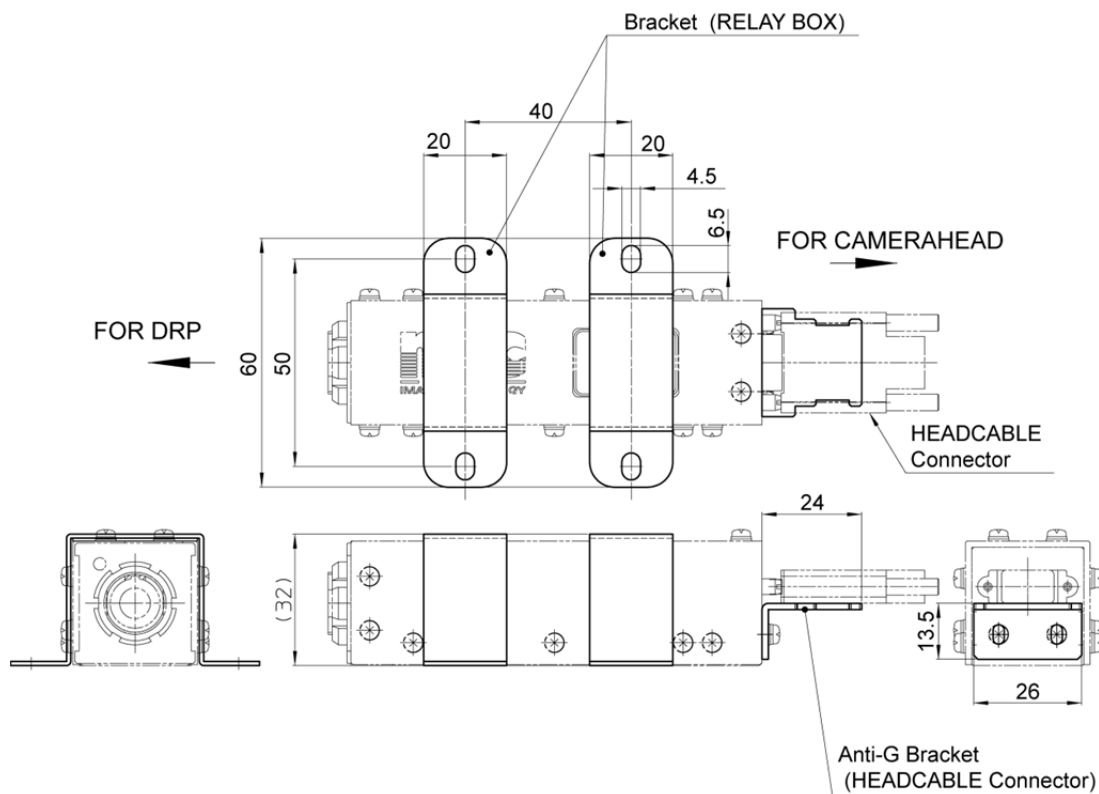


C-Cam Straight figure of mounting 2



<μ-Cam option>

8.2.28 μ-Cam Fixing bracket, Relay box + Fixing bracket, Head Cable Connector



Fix the HEADCABLE Connector onto the fixing bracket with a cable-tie enclosed.