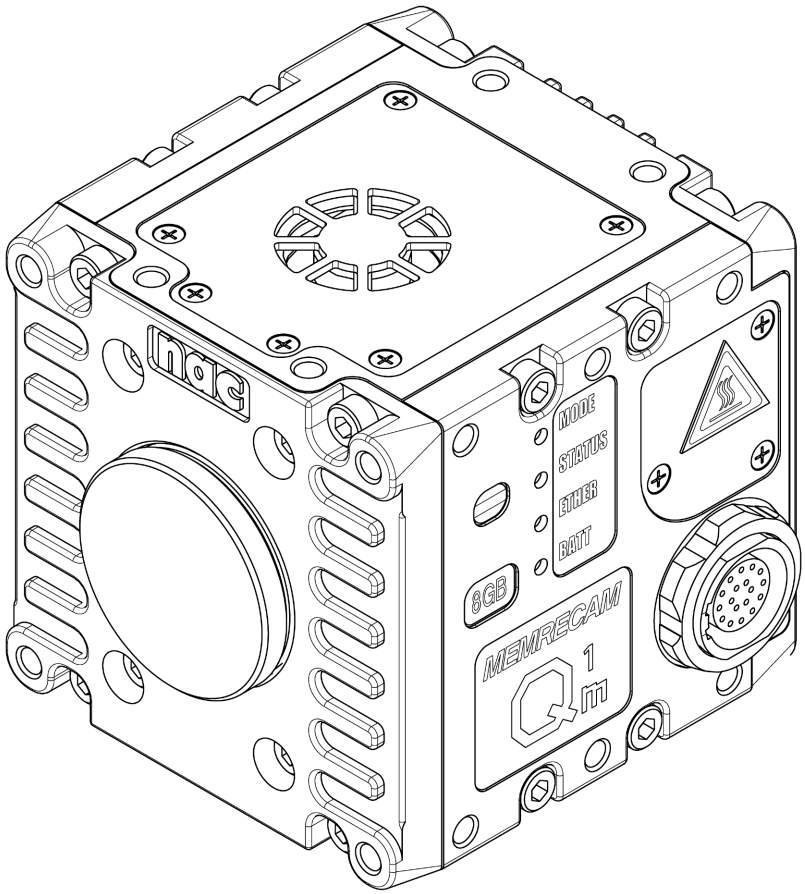
IMAGE TECHNOLOGY



High Speed Camera System

MEMRECAM Q1v

MEMRECAM Q1m

Model ST-822

User's Manual

NOV 2020

Read before Use

Information to the User

FCC Information

Note:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance information.
This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

U.S. Responsible Party : nac Americas Inc.
Address : 193 Jefferson Ave, Suite 102 Salem, MA 01970 USA
Tel. No. : +1-833-600-0261

Product name	Basic Model no.
MEMRECAM Q1m	MODEL V-208
MEMRECAM Q1v	MODEL V-209
MEMREAM Q-HUB	MODEL V-847

CE marking

This product with the CE marking complies with the EMC 2014/30/EU.

KC marking

Company / Manufacturer	nac Image Technology Inc.
Country of Origin	Japan

Product name	Basic Model no.	Cert. no.
MEMRECAM Q1m	MODEL V-208	MSIP-REM-nac-V-208
GX-HUB	MODEL V-846	MSIP-REM-nac-V-846
MEMREAM Q-HUB	MODEL V-847	MSIP-REM-nac-V-847

A 급 기기 (업무용 방송통신기자재)

이 기기는 업무용 (A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며 , 가정외의 지역에서 사용하는 것을 목적으로 합니다 .

Features of This Unit

The MEMRECAM Q1m/Q1v is a handheld high speed digital camera capable of high speed filming in a variety of environments. x

High Speed • High Resolution • High Sensitivity Image Sensor

Equipped with a highly sensitive CMOS sensor for color or B/W to enable high speed operation at high resolutions.

The Q1m is capable of filming a maximum of 2,000 frames per second at 1280 × 1024 pixels, and a maximum of 87,000 frames per second by reducing the horizontal and vertical pixels filmed. The sensitivity is ISO 1,000 for color and ISO 6,400 for B/W.

In high sensitivity mode, Q1m would be ISO 3,200 (Color)/ISO 20,000 (B/W) respectively. (HXLink Ver. 1.91a or greater required)

The Q1v is capable of filming a maximum of 8,000 frames per second at 640 × 480 pixels, and a maximum of 87,000 frames per second by reducing the horizontal and vertical pixels filmed. The sensitivity is ISO 8,000 for color and ISO 50,000 for B/W.

In high sensitivity mode, Q1v would be ISO 25,000 (Color)/ISO 160,000 (B/W) respectively. (HXLink Ver. 1.92a or greater required)

Attention

- Above sensitivity is at 1,000fps (full resolution). In specific combination of framing rate and resolution, the sensitivity could be lower.

Onboard Memory

Equipped with a memory with a maximum of 8GB. (Memory may vary according to model.)

With the Q1m 8GB/ 1000pps/ 1280 × 1024/ 8 bit recording model, high speed filming at a high resolution is possible for as long as 6 seconds.

Superior Performance

High speed photography requiring advanced techniques can be easily performed.

Perform continuous recording to the semiconductor memory or via recording trigger input with confidence that images will no be accidentally lost.

Flexible Image Playback

Slow motion playback of recorded images or repeated playback in a specified range is possible. Detailed image analysis can be conducted with on a PC.

High-Speed Network Transfer

Recorded images can be digitally saved to a PC through the network, including the data settings during recording and the trigger timing. 1000BASE-T internet is used for high speed transfer even for video data with high resolution/long recordings.

Memory Backup

Protects against losing recorded images during unexpected power loss with the memory backup function of an internal battery.

Various External Interfaces

Connect Q-Cam cables to use a wide variety of external input/output interfaces, including 1000BASE-T internet, recording start signal input, discrete status signal input/output, exposure pulse signal output and recording trigger signal input. System corresponds to a wide range of recording conditions for individual cameras.

- The operating methods for the MEMRECAM Q1m and Q1v are basically identical. This guide focuses the descriptions on the Q1m. Further explanations for items requiring Q1v descriptions are provided for each model

Trademarks

MEMRECAM is a trademark of NAC Image Technology.
Microsoft Windows is a registered trademark of Microsoft Corporation USA.
Other company names and product names noted here are trademarks or registered trademarks of those companies.

Descriptions of the Q1m/Q1v firmware Ver 1.30 and the HXLink Ver 1.92a is provided in this manual.

The contents of this document may change without notice.

Safety Precautions

Be sure to follow these safety items to avoid damage or bodily injury.

■ Distinctions between the levels of bodily injury and damage

The distinctions between the levels of bodily injury and damage occurring from improper use are described below.

⚠ **Danger**	Extreme danger that may result in death or serious injury.
⚠ **Warnings**	Potential danger that may result in death or serious injury.
⚠ **Caution**	Potential danger that may result in minor injury or damage to the device.

■ Warning Symbols

Descriptions are provided for the following warning symbols.

	Prohibited item
	Mandatory item.

⚠ Danger

Using the AC Adapter (Common)	
	•**Do not use the AC adapter for anything other than specified.** (Malfunction or fire may occur.)

⚠ Warnings

Using the main camera unit	
	• **Do not disassemble or alter** (Do not loosen screws on the main camera unit or open the cover even if the camera malfunctions.) → Contact the store where purchased for inspection • maintenance •repair.
	• **Do not use in locations with smoke or flammable or corrosive gases, or strong magnetic fields** (Malfunction, injury or fire may occur.) → Do not use in dirty, dusty or humid locations.
	• **If there is a malfunction, unplug the cables connected to the camera and the power plug for the AC adapter** (If water or other foreign objects get inside, if the exterior breaks due to being dropped, if the camera becomes hotter than normal, or if smoke, odors or noises are emitted. The camera becomes warmer during operation so this is not a malfunction.) → Contact the store where purchased or our service center.

Confirm the input power (Q1m/Q1v)	
	• **Check the input power before connecting.** • During AC adapter use:AC100 to 240V/47 to 63Hz • During DC power connection:DC20 to 32V (Malfunction, electrical shock or fire may occur if connected to the wrong power supply.)

⚠ Warnings

Using the Q-HUB	
	• **Do not disassemble or alter** (Do not loosen screws on the MX-5 unit or open the cover even if the MX-5 malfunctions.) → Contact the store where purchased for inspection • maintenance • repair.
	• **Do not use in locations with smoke or flammable or corrosive gases, or strong magnetic fields** (Malfunction, injury or fire may occur.) → Do not use in dirty, dusty or humid locations.
	• **If there is a malfunction, unplug the cables connected to the Q-HUB and the power plug for the AC adapter** (If water or other foreign objects get inside, if the exterior breaks due to being dropped, if the M-Cam becomes hotter than normal, or if smoke, odors or noises are emitted. The M-Cam heats up during operation so this is not a malfunction.) → Contact the store where purchased or our service center.

Confirm the input power (Q-HUB)	
	• **Check the input power before connecting.** • During AC adapter use:AC100 to 240V/47 to 63Hz • During DC power connection:DC20 to 32V (external battery use DC22.5 to 32V) (Malfunction, electrical shock or fire may occur if connected to the wrong power supply.)

⚠ Warnings

Using the Q-HUB BATTERY PACK	
	• **Do not disassemble or alter** (Do not loosen screws on the Q-HUB BATTERY PACK or open the cover even if the Q-HUB BATTERY PACK malfunctions.) → Contact the store where purchased for inspection • maintenance • repair.
	• **Do not use in locations with smoke or flammable or corrosive gases, or strong magnetic fields** (Malfunction, injury or fire may occur.) → Do not use in dirty, dusty or humid locations.
	• **If there is a malfunction, unplug the cables connected to the Q-HUB BATTERY PACK and the power plug for the AC adapter** (If water or other foreign objects get inside, if the exterior breaks due to being dropped, if the Q-HUB BATTERY PACK becomes hotter than normal, or if smoke, odors or noises are emitted. The Q-HUB BATTERY PACK becomes warmer during operation so this is not a malfunction.) → Contact the store where purchased or our service center.

⚠ Caution

Using the cables (Common)	
	• Do not unplug the cable with the power on. • Do not put foreign articles such as metal, trash or water inside the connector. (Malfunction or electrical shock may occur if the cable is connected or removed with the power on.) → Unplug the cable only after turning off the power.
	• **Do not touch the plug or connector with wet hands.** (Malfunction, electrical shock or fire may occur.)

Using the AC Adapter (Common)	
	• **Do not disassemble or alter** (Do not loosen screws on the main camera unit or open the cover even if the camera malfunctions.) → Contact the store where purchased for inspection • maintenance • repair.
	• **Do not use in locations with smoke or flammable or corrosive gases, or strong magnetic fields** (Malfunction, injury or fire may occur.) → Do not use in dirty, dusty or humid locations.
	• **Do not subject to strong vibration or impact** (The AC adapter does not have vibration or impact resistance properties based on actual impact testing. If subject to strong impact or vibration, malfunction or injury may occur.) → Contact the store where purchased or our service center if using in such environments.
	• **If there is a malfunction, unplug the power cord.** (If water or other foreign objects get inside, if the exterior breaks due to being dropped, if the camera becomes hotter than normal, or if smoke, odors or noises are emitted. The camera becomes warmer during operation so this is not a malfunction.) → Contact the store where purchased or our service center.

⚠ Caution

Using the main camera unit	
	• **Do not interfere with the release of heat from the camera** (The Q1m/Q1v has a fan that cools the camera. Do not block the intake ports or vents. Additionally, do not place in narrow locations where there is no air circulation, or on carpet or bedding.If heat builds up inside, malfunction or fire may occur.)
	• **Do not put fingers or objects in the lens mount** (The sensor can be seen if the lens or cap on the lens mount of the camera is removed. If fingers or items are placed inside, the sensor may become scratched or dirty so the image quality may be adversely affected.)
	• **Do not place heavy items on this device.** (If tipped over or dropped, the exterior may be damaged, which may cause bodily injury. Additionally, if heavy items are placed on it, the exterior may be deformed, causing the interior components to be damaged and malfunction.)
	• **Do not place heavy items on this device.** • Use temperature range: 0 to 40°C, humidity 30 to 80%RH, no condensation • Storage temperature range: -10 to 60°C, humidity 20 to80%RH, no condensation.

Using the Battery	
	• **Do not leave the camera in locations with high temperatures, such as in closed vehicles, near flame, or on top of stoves.** (The Q1m/Q1v has a memory backup battery which may cause the battery to leak or reduce the battery performance or life.)

Handling while moving or transporting	
	• **Use the dedicated storage case for moving or transporting this device** (To protect the camera from malfunction, use the optional dedicated storage case for transport.)

⚠ Caution

Using the Battery (Q1m/Q1v power battery option)	
	• **Use environment** • Avoid using in locations with smoke or corrosive gases, or strong magnetic fields • Do not leave in direct sunlight or locations subject to rain or salt water. • Do not use in dirty, dusty or humid locations.
	• **Do not leave the battery in locations with high temperatures, such as in closed vehicles, near flame, or on top of stoves** (It may cause the battery to leak or reduce the battery performance or life.)
	• **Check the ambient temperature of the location where used and the location where stored** •Temperature range for use: 0 to 40°C, humidity 30 to 80%RH, no condensation •Temperature range for storage: -20 to 30°C,humidity 20 to 80%RH, no condensation

Using the Battery (Q-HUB BATTERY PACK)	
	• **Use environment** •Avoid using in locations with smoke or corrosive gases, or strong magnetic fields •Do not leave in direct sunlight or locations subject to rain or salt water. •Do not use in dirty, dusty or humid locations.
	• **Do not leave the battery in locations with high temperatures, such as in closed vehicles, near flame, or on top of stoves** (It may cause the battery to leak or reduce the battery performance or life.)
	• **Check the ambient temperature of the location where used and the location where stored** •Temperature range for use: 5 to 40°C , humidity 30 to 80%RH, no condensation •Temperature range for storage: -20 to 30°C, humidity 20 to 80%RH, no condensation.

⚠ Caution

Using the AC Adapter (Q1m/Q1v)	
	• **Use environment** • Avoid using in locations with smoke or corrosive gases, or strong magnetic fields • Do not leave in direct sunlight or locations subject to rain or salt water. • Do not use in dirty, dusty or humid locations.
	• **Check the input power** (The AC adapter is AC100 to 240V, 47 to 63Hz so check the power voltage, frequency and polarity before connecting to a power source.)
	• **Check the ambient temperature of the location where used and the location where stored** • Temperature range for use: 0 to 60°C, humidity 5 to 95%RH, no condensation • Temperature range for storage: -40 to 85°C,humidity 5 to 95%RH, no condensation
	• **Make sure unit is grounded** (Ground with an AC3 pin connector. If not grounded, electrical shock may occur upon contact with the camera.)

⚠ Caution

Using the AC Adapter (Q-HUB)	
	• **Use environment** ●Avoid using in locations with smoke or corrosive gases, or strong magnetic fields ●Do not leave in direct sunlight or locations subject to rain or salt water. ●Do not use in dirty, dusty or humid locations.
	• **Check the input power** (The AC adapter is AC100 to 240V, 47 to 63Hz so check the power voltage, frequency and polarity before connecting to a power source.)
	• **Check the ambient temperature of the location where used and the location where stored** ●Temperature range for use: 5 to 40°C, humidity 30 to 80%RH, no condensation ●Temperature range for storage: -20 to 30°C,humidity 20 to 80%RH, no condensation.
	• **Make sure unit is grounded** (Ground with an AC3 pin connector. If not grounded, electrical shock may occur upon contact with the camera.)

Handling when moving or transporting the AC adapter	
	• **Turn off the power and unplug the connected cables** (Make sure the power is turned off and the cables unplugged when moving the AC adapter. Fire, electrical shock or malfunction may be caused.)

In addition to that mentioned above, unexpected problems may occur depending on the conditions of use of this device. Therefore, carefully read the various items mentioned in this manual as well as in the user's guide for peripheral devices (or user's manual) before using. Additionally, immediately contact the store if there are any questions regarding this device.

■ Warning Symbols

There are warning labels and displays in locations on the device that require precautions for safe use. Please read these warnings before operating. Additionally, read the user's guide or instruction manual for safe and proper use.

Contact your store if you do not understand your device.

Symbols Used on Warning Labels

This describes the symbols shown on the warning labels.

- **Safety alert symbol**

  This is an alert to you or other users of the potential danger during use of this device. Carefully read the message next to this symbol and follow the instructions for safe use of this device.

- **Grounding terminal symbol**

  Indicates the site of a protective grounding terminal. If not grounded, electrical shock may occur from the metallic and other parts of this device. Make sure to ground to avoid danger.

- **High voltage warning symbol**

  Indicates the site of high voltage that is dangerous if touched. When replacing fuses, make sure to unplug the power cable from the outlet. Do not open the cover. Depending on the device, some parts may generate high voltage internally so opening the cover may result in electrical shock.

■ Regular Replacement of Parts

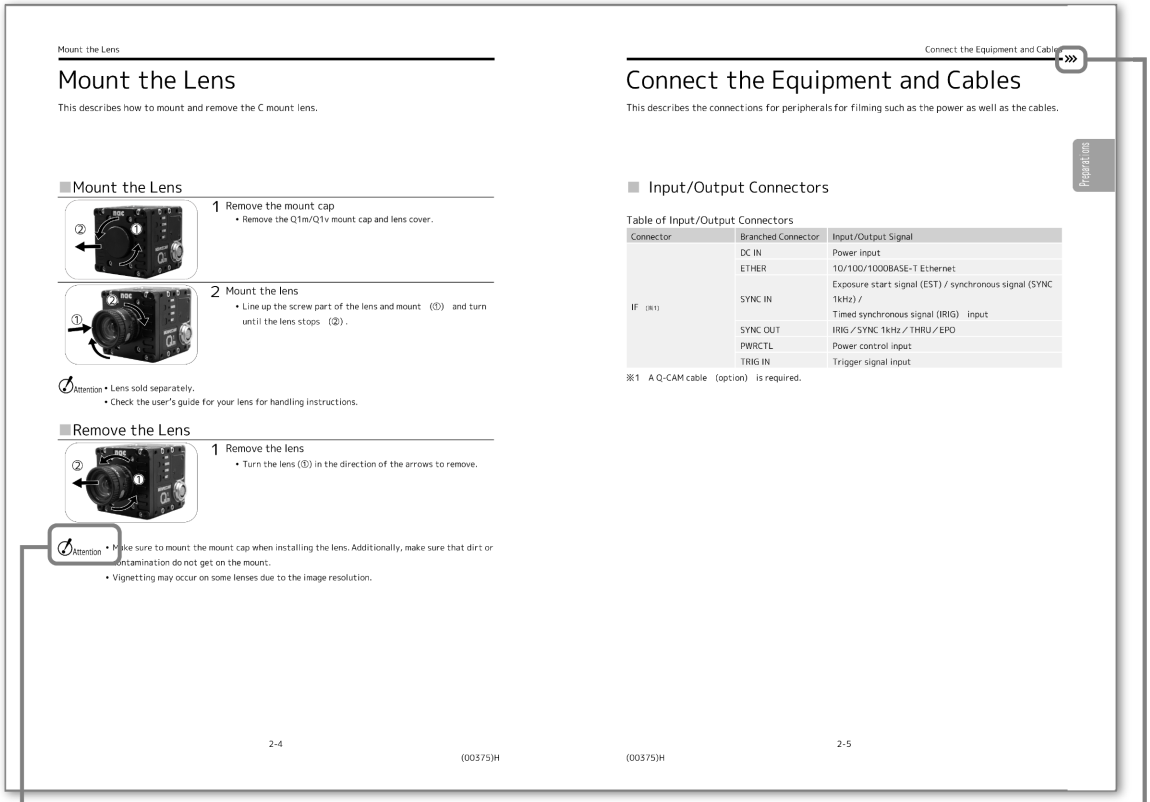
- **Memory Backup Battery**

  In general, replace the memory backup battery one year after purchase. However, if there is a rapid loss of charge or problems during use, replace immediately. Replacement cannot be performed by users so contact your store or our service center.

■ Warranty

The warranty is valid for one year after purchase.
Refer to the attached warranty for details.

This Booklet



Mount the Lens

Mount the Lens

This describes how to mount and remove the C mount lens.

Mount the Lens

1 Remove the mount cap
- Remove the Q1m/Q1v mount cap and lens cover.

2 Mount the lens
- Line up the screw part of the lens and mount (①) and turn until the lens stops (②).

Attention
- Lens sold separately.
- Check the user's guide for your lens for handling instructions.

Remove the Lens

1 Remove the lens
- Turn the lens (①) in the direction of the arrows to remove.

Attention
- Make sure to mount the mount cap when installing the lens. Additionally, make sure that dirt or contamination do not get on the mount.
- Vignetting may occur on some lenses due to the image resolution.

2-4

(00375)H

Connect the Equipment and Cables

Connect the Equipment and Cables

This describes the connections for peripherals for filming such as the power as well as the cables.

Preparations

Input/Output Connectors

Table of Input/Output Connectors

Connector	Branched Connector	Input/Output Signal
IF (※1)	DC IN	Power input
	ETHER	10/100/1000BASE-T Ethernet
	SYNC IN	Exposure start signal (EST) / synchronous signal (SYNC 1kHz) / Timed synchronous signal (IRIG) input
	SYNC OUT	IRIG / SYNC 1kHz / THRU / EPO
	PWRCTL	Power control input
	TRIG IN	Trigger signal input

※1 A Q-CAM cable (option) is required.

2-5

(00375)H

Attention Mark

Attention It indicates precautions.

CHECK It indicates matters to be confirmed or to be known.

It means "to be continued to next page".

Table of Contents

Q-HUB BATTERY PACK

Contact

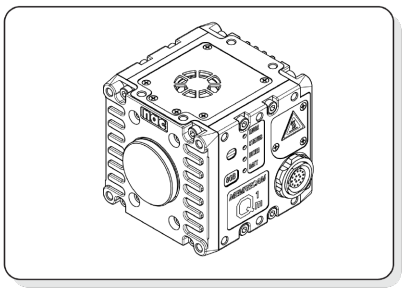
1

Introduction

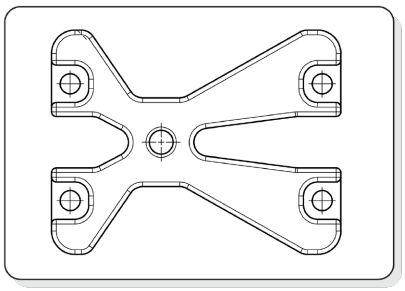
(00375)H

Verify the Standard Components

The following are included as standard components of the MEMRECAM Q1m/Q1v.
Make sure that all are included.



● MEMRECAM Q1m/Q1v

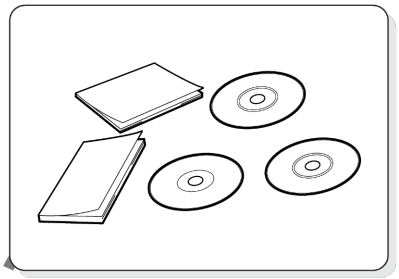


● Tripod plate

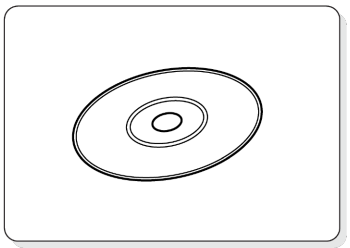
- MEMRECAM Q1m/Q1v　　Q1m/Q1v camera unit
- Tripod plate　　Plate to mount the camera to the tripod

Attention

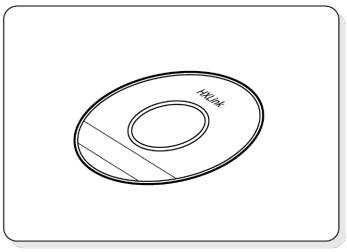
- The MEMRECAM Q1m/Q1v includes the following models.
- Memory 4GB / 8GB
- Make sure the contents match the purchased model.
- Do not use in a vibrating environment with the tripod plate mounted. Make sure to secure using the camera unit screw holes.
- No Image compensation data required to copy from CD, included in a camera package, as Q1m/Q1v camera with firmware Ver. 1.20 & HXLink Ver. 1.82b or greater has the FPN data built-in. Refer to (⏭🕮 3-2) for details



● Q1 KIT

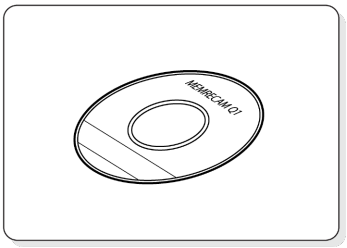


● HXLink CD-ROM



● HXLink User’ s Manual
(Electronic Manual)

● HXLink
Quick Start Guide



● Q1 User’ s Manual CD-ROM
(Electronic Manual)

●Q1 KIT Set of Q1m/Q1v PC control software and user’s guide

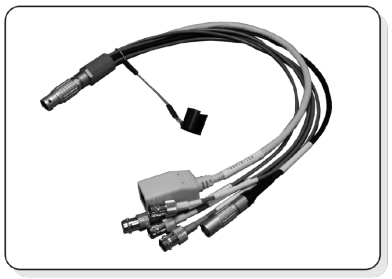
●HXLink CD-ROM	PC Control Software CD-ROM
●HXLink User’s Manual	HXLink Detailed User’s Manual(Electronic Manual)
●HXLink Quick Start Guide	HXLink Simple Users Guide
●Q1 User’s Manual CD-ROM	Q1 User’s Manual (Electronic Manual) (this guide)

CHECK

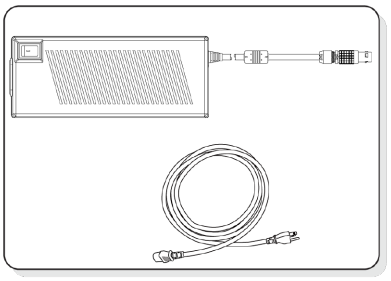
• The Q1m/Q1v is operated using the HXLink. Refer to the HXLink user’s guide for the method of operation using the HXLink.

Main Options

The main options for the MEMRECAM Q1m/Q1v are as follows.



● Q-Cam Cable



● MINI AC POWER SYSTEM

● Q1 Carrying Case

• Q-Cam Cable	Dedicated input/output cable for the Q1m/Q1v and Q5
• MINI AC POWER SYSTEM	Set of dedicated AC adapter and AC power cable for the Q1m/Q1v
• Q1 Carrying Case	Case that houses the Q1m/Q1v unit for safe transport

Attention

- In addition to the Q1 carrying case, this guide is used for the aforementioned options. Make sure to consider their purchase.
- Do not use the Q-Cam cables with the MEMRECAM HX or GX series.
- Refer to (⏭🕮 5-2) for Q1m/Q1v Power Battery
- Refer to (⏭🕮 6-2) for details on Q-Hub

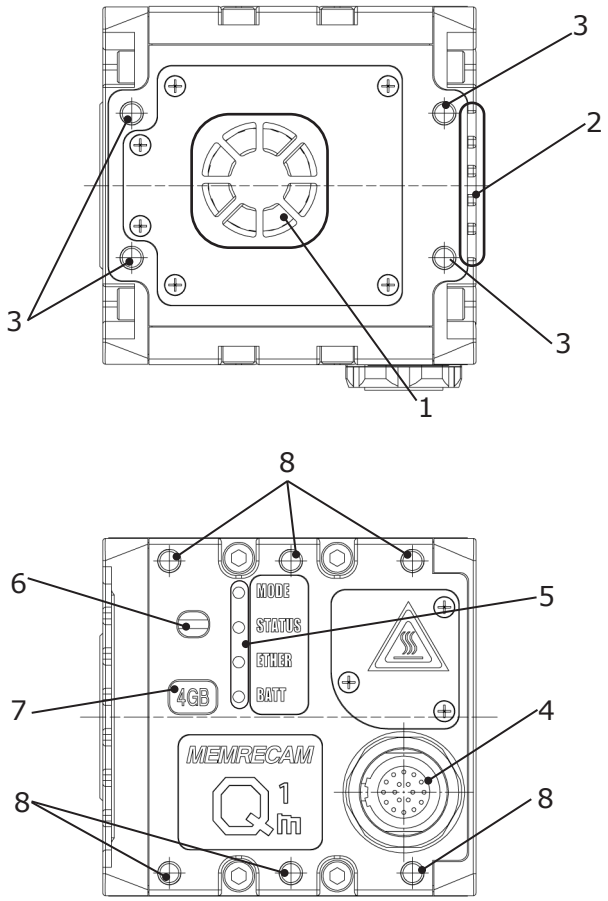
CHECK

- If there is a problem with the Q5, use the optional ResQ ADAPTER SYSTEM and it may be possible to save the images on the Q5 DRP to PC by way of USB. Contact a retail outlet or our company to purchase this optional product.

External Appearance and Names for this Unit

■ External Appearance and Names for this Unit

Top, Right Side

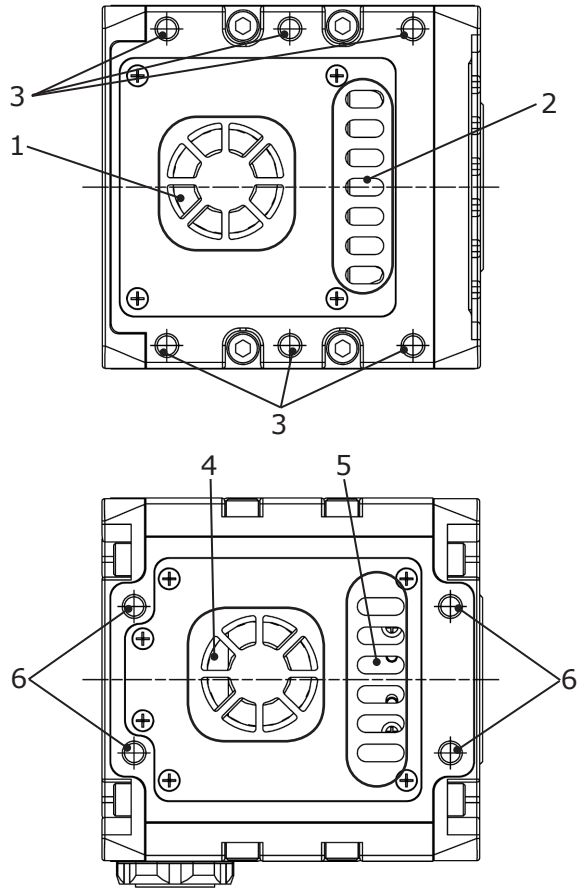


1 Air inlet
2 Vents
3 Screw holes (4 locations, M4 depth 5 mm)
4 IF connector
5 LED
6 Color camera identification sticker (not used with B/W cameras)
7 Memory size sticker
8 Screw holes (6 locations, M4 depth 5 mm)

Attention

- Do not use screws longer than the depth of the screw holes as this may cause a malfunction.

Left side, Bottom

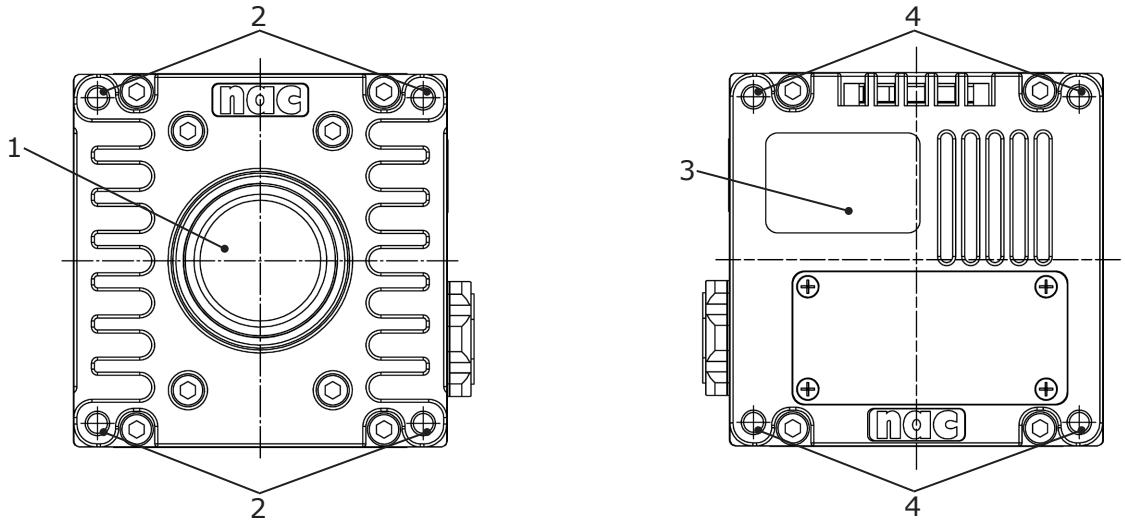


1 Air inlet
2 Vents
3 Screw holes (6 locations, M4 depth 5 mm)
4 Air inlet
5 Vents
6 Screw holes (4 locations, M4 depth 5 mm)

Attention

- Do not use screws longer than the depth of the screw holes as this may cause a malfunction.

Front, Back



1 Lens mount (C mount)

2 Screw holes (4 locations M4 depth 7 mm)

3 Steel plate (indicating the production number)

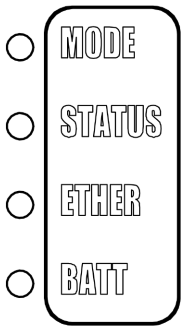
4 Screw holes (4 locations M4 depth 7 mm)

Attention

- Do not use screws longer than the depth of the screw holes as this may cause a malfunction.

Status LED

The four status LED on the right side of the unit display the camera status.

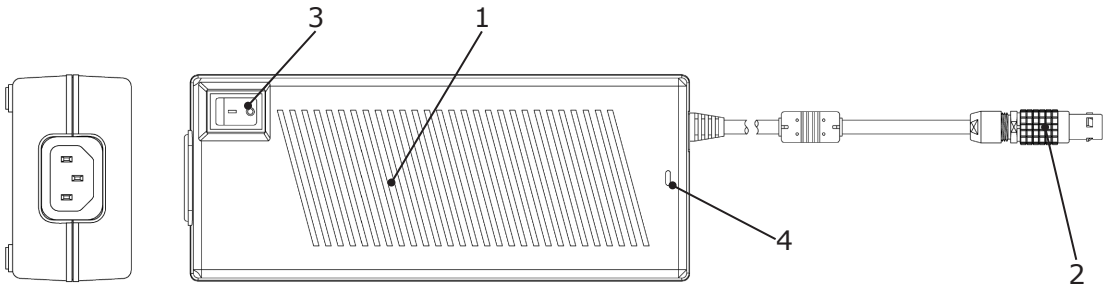


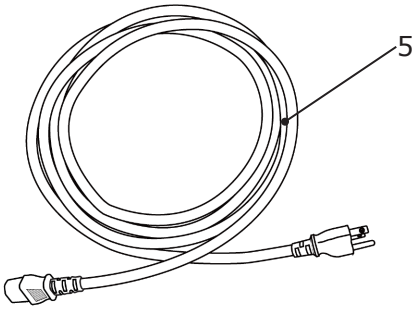
LED	Status LED	Operation
MODE	Orange (Flashing)	REC mode (Flashing: set to EST mode, EST pulse input)
	Blue	STOP / READY mode
	White (Flashing)	VIEW mode (Flashing: set to EST mode, EST pulse input)
	Purple (magenta)	ARM mode (camera video output, recorded memory contents are destroyed, new camera video is recorded in memory)
	Not lit	Power OFF or operating
STATUS	Green	Normal operation
	Red	Fail state (Abnormal power voltage detected)
	Red(Flashing)	Fail state: Sensor temperature rise detection. Slow Blinking=Caution, Fast Blinking=Danger)
	Not lit	Power OFF or operating
ETHER	Orange (Flashing)	Network communicating at 1000BASE-T
	Orange (Flashing)	Network communicating at 100BASE-TX
	Not lit	No network connection
BATT	Green	Memory backup, DC input, battery (maximum charge)
	Flashing green	Memory backup, battery only (maximum charge)
	Orange	Memory backup, DC input, battery (charging)
	Flashing orange	Memory backup, battery only (charging)
	Red	Memory backup, DC input, battery (low battery charge)
	Flashing red	Memory backup, battery only (low battery charge)
	Not lit	Memory backup is OFF (no recorded data)
	Alternating red and green	Thermal shutdown started

Attention

- Unable to go into VIEW or ARM mode if STATUS blinks red faster.
- VIEW,ARM mode stops to prevent the trouble by the temperature rise of the camera when the temperature of the camera is abnormally high.
- When thermal shut down occurs, please switch it off once.

■AC POWER SYSTEM External Appearance and Names

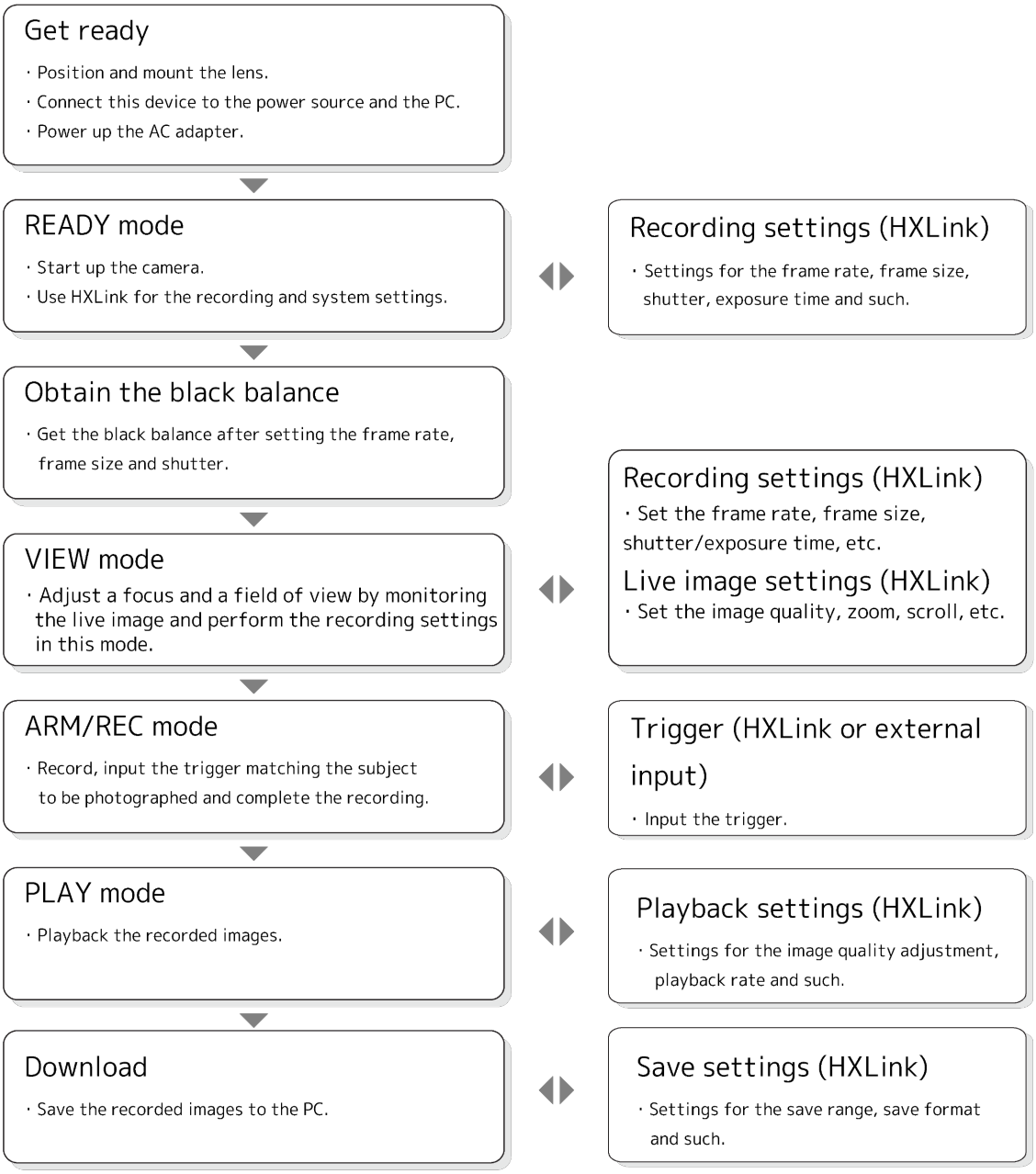




1 AC adapter
2 DC connector
3 Power switch
4 LED
5 AC cable

Flow of Operations

Q1m/Q1v is operated with the Windows control software HXLink.



2

Preparations

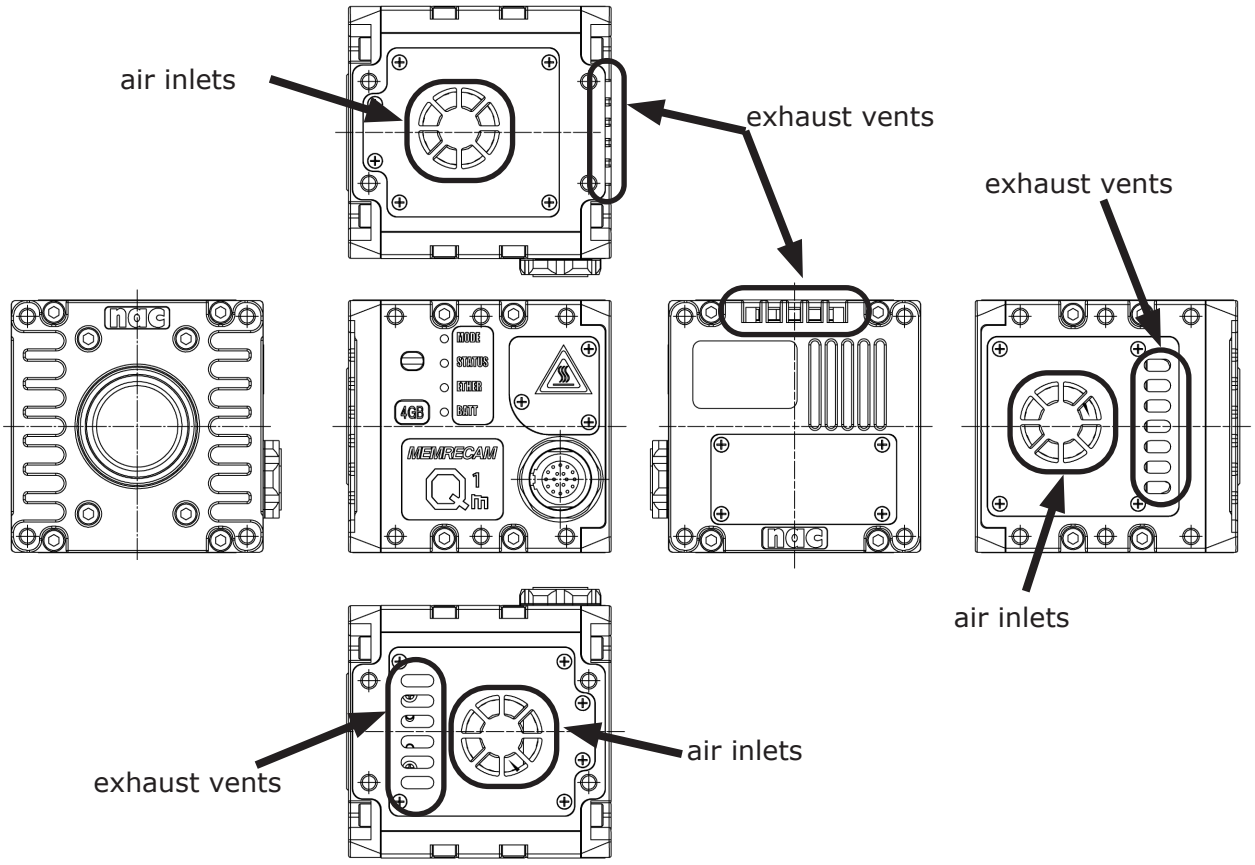
Set Up this Unit

This describes the method of setting up for filming with the MEMRECAM Q1m/Q1v.

■ Mounting the Camera

Attention

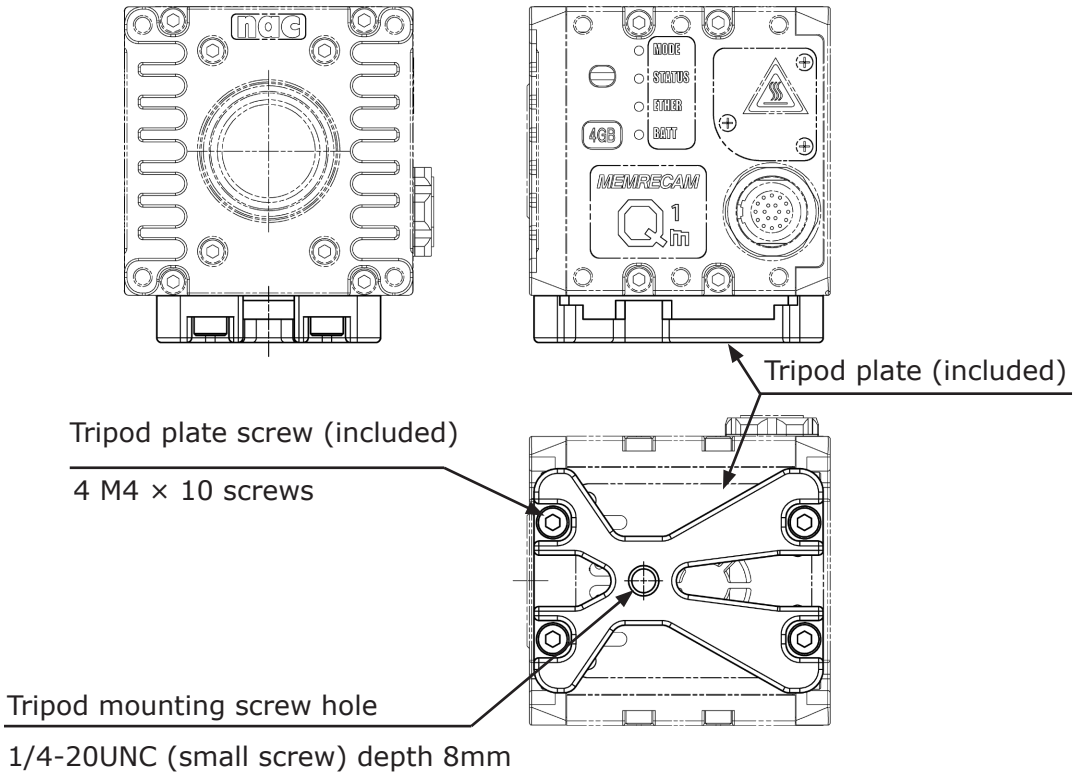
- There are air inlets and exhaust vents on this device for cooling, and ventilation occurs with a fan.
- Install with adequate distance from walls and such so ventilation is not obstructed. Install in a well ventilated location if possible.
- Do not block the air inlets or exhaust vents with objects or cloth.



Arrows indicate air inlets and exhaust vents

■ Mounting on a Tripod

Mount the included tripod plate to the camera when mounting the camera on the tripod.
The mounting screws can be used to mount tripods with diameters of 1/4-20UNC (small screw) and lengths of 8mm or less.

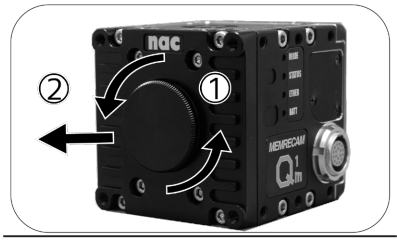


Attention
- There are no anti-vibration or shock resistance functions on the tripod plate.
- Contact your retail outlet to purchase the corresponding tripod.

Mount the Lens

This describes how to mount and remove the C mount lens.

■ Mount the Lens



1 Remove the mount cap

- Remove the Q1m/Q1v mount cap and lens cover.

2 Mount the lens

- Line up the screw part of the lens and mount (1) and turn until the lens stops (2) .

Attention

- Lens sold separately.
- Check the user's guide for your lens for handling instructions.

■ Remove the Lens

1 Remove the lens

- Turn the lens (1) in the direction of the arrows to remove.

Attention

- Make sure to mount the mount cap when installing the lens. Additionally, make sure that dirt or contamination do not get on the mount.
- Vignetting may occur on some lenses due to the image resolution.

Connect the Equipment and Cables

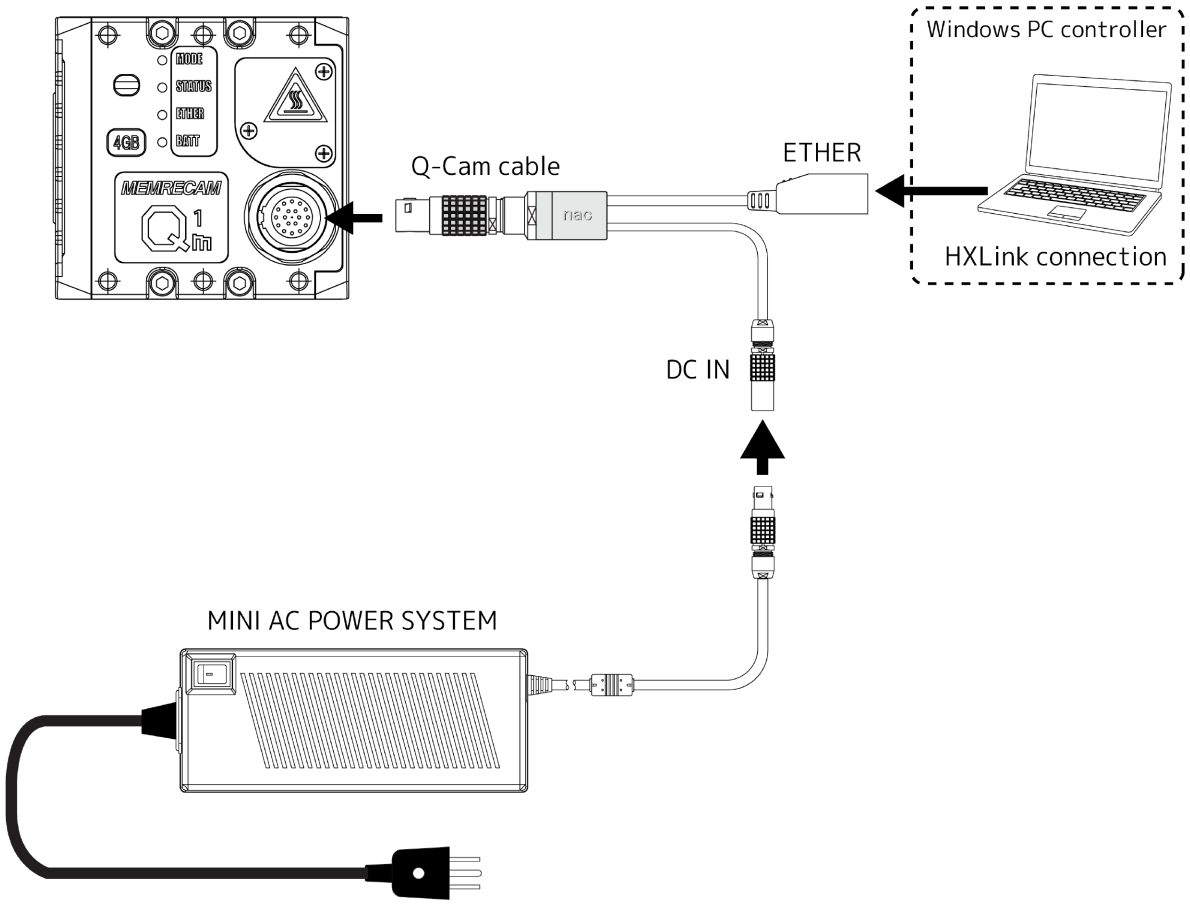
This describes the connections for peripherals for recording such as the power as well as the cables.

■ Input/Output Connectors

Connector	Branched Connector	Input/Output Signal
IF (*1)	DC IN	Power input
	ETHER	1000BASE-T Ethernet
	SYNC IN	Exposure start signal (EST) Synchronous signal (SYNC 1kHz, Continuous pulse synchronization) Timed synchronous signal (IRIG-B DCLS) input
	SYNC OUT	IRIG / SYNC 1kHz / THRU / EPO/ARM Status output
	PWRCTL	Power control input
	TRIG IN	Trigger signal input

*1 Q-Cam cable (option) is required.

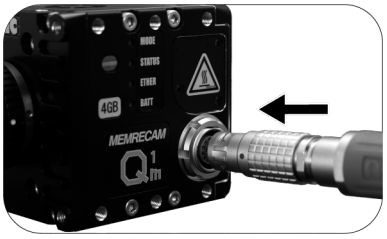
■ Connection Drawing



Attention
- The Q-Cam cable, AC POWER SYSTEM and Windows PC controller are sold separately.
- The Q-Cam Cable in the figure shows an abbreviated version of the connector.

■Connect the Q-Cam Cable

Connect the Q-Cam cable sold separately.



1 Connect the Q-Cam cable to the camera

- Line up the red arrow of the Q-Cam cable plug with the IF connector on the camera and plug in until it clicks.

2 Install the locking clip

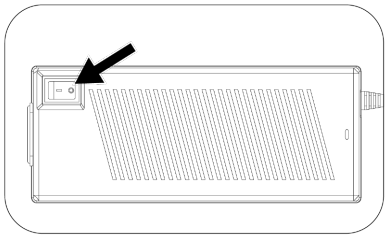
- Mount the locking clip to prevent removal of the cable.

Attention

- Make sure to install the locking clip when using in vibrating environments.
- The Q-Cam cable is a dedicated cable for Q1m/Q1 and Q5. Do not use with the MEMRECAM GX or HX series.

■ Connect the Power

Connect the MINI AC POWER SYSTEM sold separately.

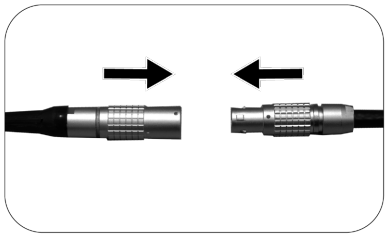


1 Turn the power switch OFF

- Turn the AC adapter power switch OFF.

2 Connect the AC cable to the AC adapter

3 Plug the AC cable in



4 Connect the DC cable to the Q-Cam cable

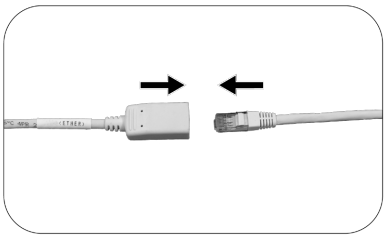
- Line up the red arrow of the AC adapter DC plug with the DC IN connector on the Q-Cam cable and plug in until it clicks.
- When unplugging the DC plug, hold the grip of the plug and pull straight out.

Attention

- Make sure to turn off the power to the AC adapter when unplugging the DC and AC cables.
- Do not open the AC adapter cover. Areas generating high voltage are dangerous.
- Make sure the connection is grounded. There is a concern of electric shock if not grounded.
- When plugging in using a 3P-2P conversion plug, connect the grounding wire to an external grounding source.
- This is an AC adapter dedicated for the MEMRECAM Q1m/Q1v so do not use on other devices.

■Connect a Windows PC Controller

Connect to a PC using an Ethernet cable.



1 Connect an Ethernet cable to the Ethernet connector of the Q-Cam cable. Connect a Windows PC

- Connect the Ethernet cable to the Ethernet (RJ45) connector of the Q-Cam cable. Connect another Ethernet cable to the Windows PC.

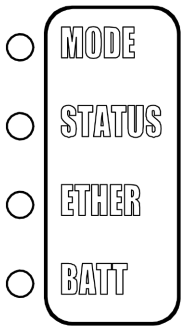
Attention
- The Q1m/Q1v is designed according to 1000BASE-T communication standards. If remote communication standards (100BASE-TX and such) are used, there will be a reduction in the updating rate.
- Use a category 5e (CAT5e) cable or greater for the Ethernet cable.
- MEMRECAM Q1m/Q1v is not supported by DHCP (⏭🕮 3-4).

Status LED

Confirmation of the MEMRECAMC Q1m/Q1v status can be made with the status LED.

Status LED

The four status LED on the right side of the unit display the camera status.



LED	Status LED	Operation
MODE	Orange (Flashing)	REC mode (Flashing: set to EST mode, EST pulse input)
	Blue	STOP / READY mode
	White (Flashing)	VIEW mode (Flashing: set to EST mode, EST pulse input)
	Purple (magenta)	ARM mode (camera video output, recorded memory contents are destroyed, new camera video is recorded in memory)
	Not lit	Power OFF or operating
STATUS	Green	Normal operation
	Red	Fail state (Abnormal power voltage detected)
	Red(Flashing)	Fail state: Sensor temperature rise detection. Slow Blinking=Caution, Fast Blinking=Danger)
	Not lit	Power OFF or operating
ETHER	Orange (Flashing)	Network communicating at 1000BASE-T
	Orange (Flashing)	Network communicating at 100BASE-TX
	Not lit	No network connection
BATT	Green	Memory backup, DC input, battery (maximum charge)
	Flashing green	Memory backup, battery only (maximum charge)
	Orange	Memory backup, DC input, battery (charging)
	Flashing orange	Memory backup, battery only (charging)
	Red	Memory backup, DC input, battery (low battery charge)
	Flashing red	Memory backup, battery only (low battery charge)
	Not lit	Memory backup is OFF (no recorded data)
	Alternating red and green	Thermal shutdown started

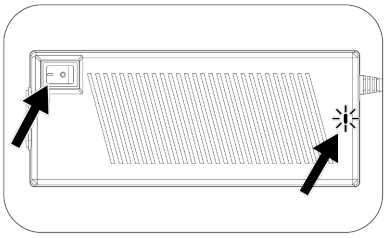
Attention

- Unable to go into VIEW or ARM mode if STATUS blinks red faster.
- VIEW,ARM mode stops to prevent the trouble by the temperature rise of the camera when the temperature of the camera is abnormally high.
- When thermal shut down occurs, please switch it off once.

Turn the Power ON/OFF

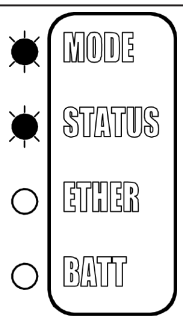
Turn the power on to start up the MEMRECAM Q1m/Q1v.

■Start up the Q1m/Q1v



1 Turn ON the power switch of the AC adapter

- Turn the switch ON after verifying the cable is connected to the AC adapter and camera.



2 Confirm the status with the camera LED

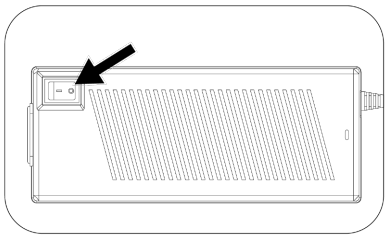
- If the power switch on the AC adapter is turned ON, the camera starts up and automatic diagnosis starts.
- MODE:Blue
  STATUS:Green
  Upon reaching this status, the camera starts up normally.

3 Execute the operations using the control software.

■Turn Off the Q1m/Q1v Power

1 Disconnect the HX Link and camera with the Windows PC

- Make sure to save the recorded image and setting before disconnecting.
- Disconnect the HX Link and Q1m/Q1v.



2 Turn OFF the AC adapter power switch

Attention

- If the AC adapter power is turned off when the memory backup battery is not charged, the recorded images are removed from the memory of this unit.
- Make sure to save any recorded images needed before turning off the power. Check the "HXLink User's Manual" for the storage method.

3

Basic Operations

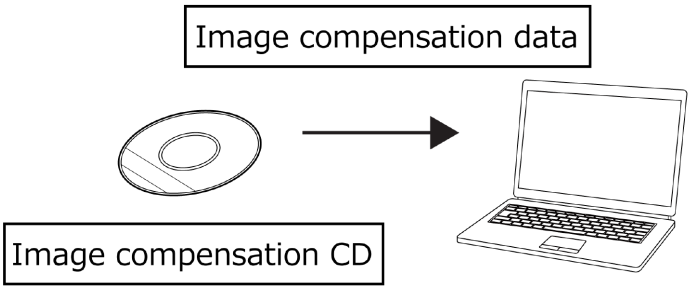
(00375)H

Image compensation data in CD

Not required to install Image compensation data with CD from Q1m/Q1v firmware Ver1.20 & HXLink Ver1.82b.

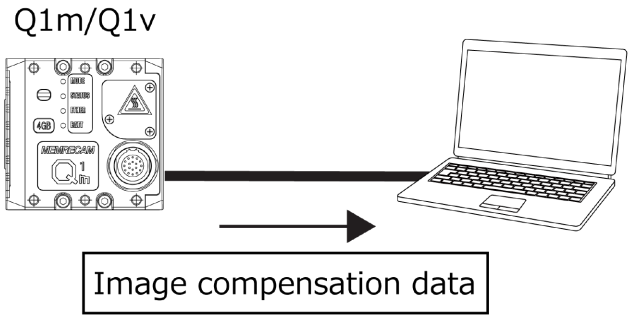
BEFORE

Used to load Image compensation data from CD



AFTER firmware Ver1.20 and HXLink Ver1.82b

Load Image compensation data automatically from Q1m/Q1v when HXLink connected



- When connecting Q1m/Q1v for the first time, it will take 10-20 sec to load Image compensation data

Attention

- It still require CD to load Image compensation data when with Q1m/Q1v Firmware Ver1.19 or less.
- Image compensation data can be loaded from multiple cameras at a time though it takes a bit longer.
- When HXLink updated to Ver1.82b or greater, it does not need to delete old Image compensation data file which was copied into your PC.

Setting the IP Address

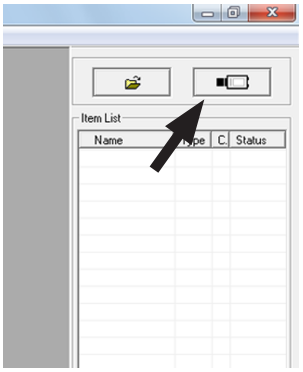
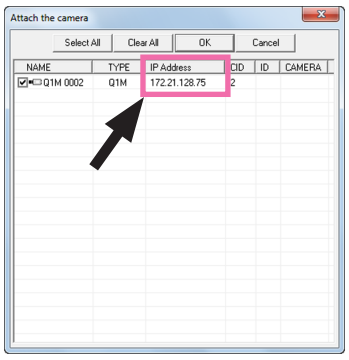
The Q1m/Q1v does not automatically get the IP addressed using the DHCP server.
Please set the IP address according to the network environment used.

Attention

- This manual is for the Q1m/Q1v. The Q5 can be changed with the same methods. Refer to each camera user's guide for the GX and HX series and to the user's guide for the HXLink.
- HXLink, GenICam, and GigE Vision Filter Driver must be properly installed.
  There are times when proper operation is not possible when GigE Vision Filter Driver and such from other companies are installed.
  Refer to the HXLink user's guide for the installation method.
- In Windows 10, please be sure to install the GigE Vision Filter Driver of HXLink 1.92a or later CD.

Check the IP Address Setting

The IP address can be checked with HXLink if the Q1m/Q1v is connected to the network used.

	1	With the power to the Q1m/Q1v ON, press the HXLink camera connection. ● Press the camera connection button to add an item.	
	2	Confirm the IP address from the list. ●The connected Q1m/Q1v is shown on the list so the IP address can be confirmed.	

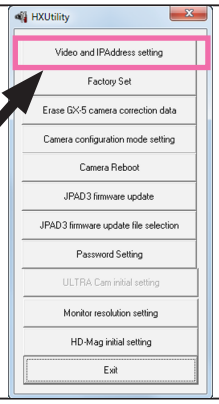
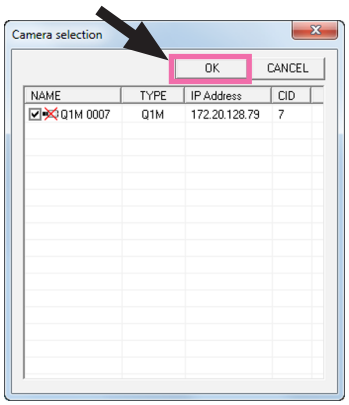
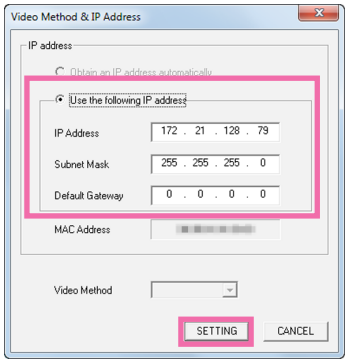
Attention

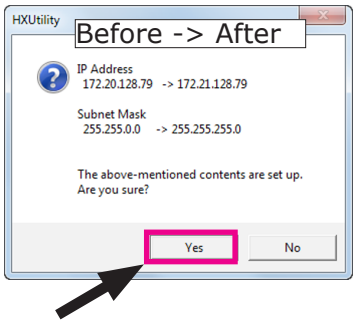
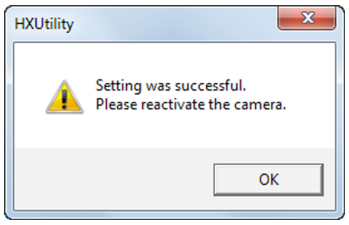
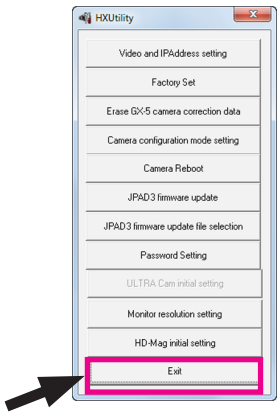
- Connection to the HXLink is not possible if the Q1m/Q1v network is not properly set, and an error will be displayed.

(00375)H

Set the Q1m/Q1v IP Address

Attention
- The HXUtility is "Camera System Setup" ("Camera System Setup 64" with the 64bit version OS).

	1	Press "Video and IPAddress settings" in HXUtility • Press the "Video and IPAddress settings" button in the menu.	
	2	Select Q1m/Q1v to change from the list. • The Q1m/Q1v that can have the settings changed is shown on the list so select the camera and press "OK".	
	3	Input the IP address to set • Set the IP address, sub-net mask and such to match the environment used. • Press "SETTING" once the input is complete.	

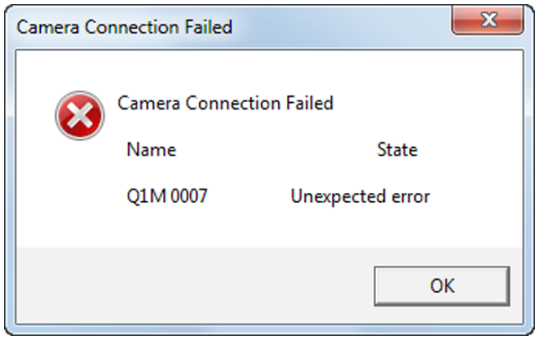
	4	The detailed contents to change are displayed. • The left side of the display is "before the change" and the right side shows "after the change". • If there are no errors in the setting contents, press "Yes". Press "No" to correct by returning to the settings screen.	
	5	After setting, turn ON the camera power • After the message is shown, turn on the Q1m/Q1v power. • Press "OK" to close the window.	
	6	The HXUtility ends • Press "Exit" to close the HXUtility.	

Attention • Make sure to close the HXUtility before using HXLink.

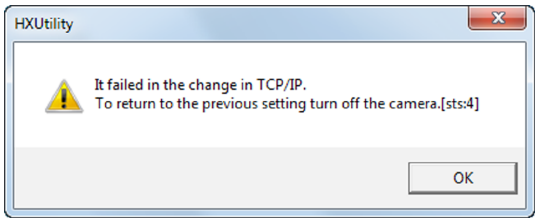
	7	The revised IP address will be enabled after the camera has been restarted.	

Attention

- When the Q1m/Q1v is connected to HXLink after setting the IP address, the following error message may appear. In this case, the IP address setting may be incorrect so please check and reset if necessary.



- When setting the IP address, the following error message may appear and it may not be possible to set the camera. Turn the camera power ON and confirm the settings again.



Using HXLink

A special application is required to operate the Q1m/Q1v. This describes the basic operations to use HXLink.

CHECK

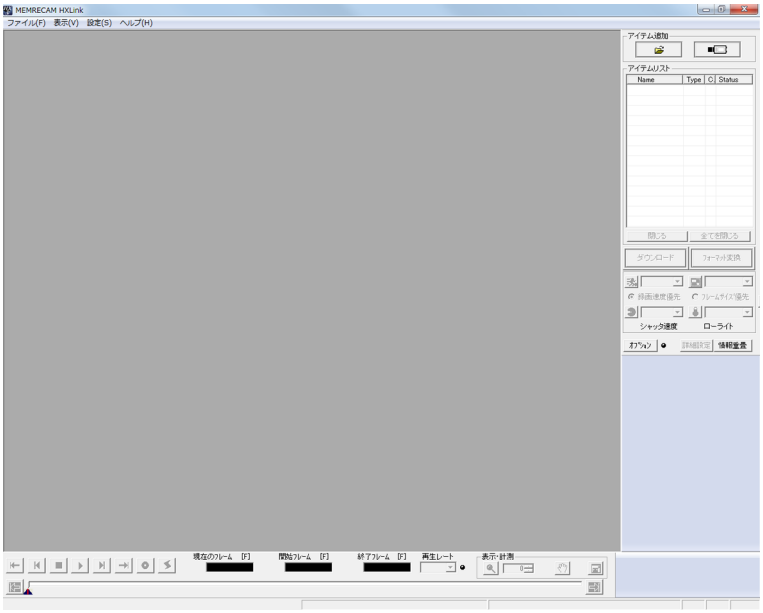
- Refer to the included HXLink guide for the installation method or detailed method of use for the applications.

HXLink GUI

The HXLink GUI includes a “Basic Mode” and an “Expert Mode”.

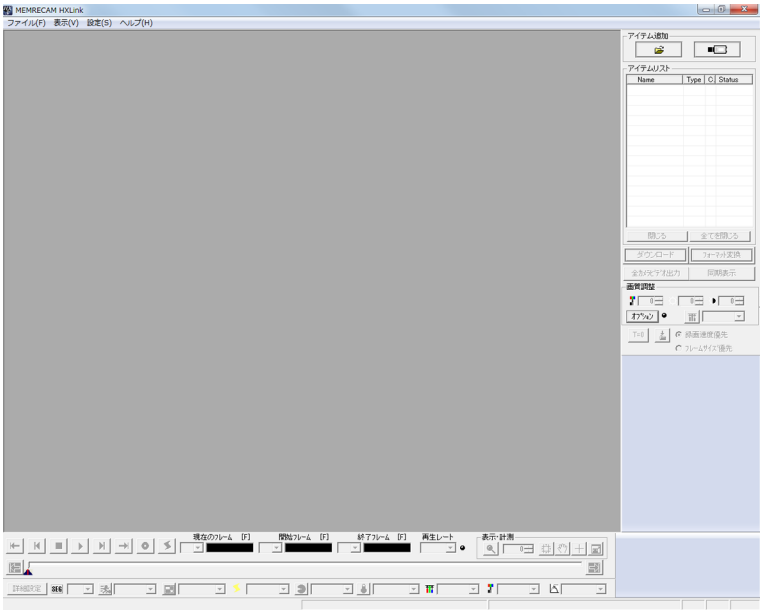
Basic Mode

Performs basic operations.



Expert Mode

Performs detailed operations.

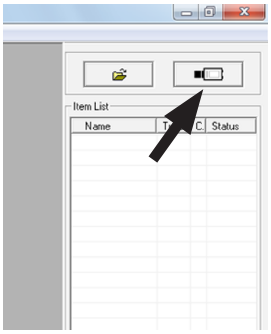


Descriptions in this guide use the “Basic Mode”.

Connect the Camera

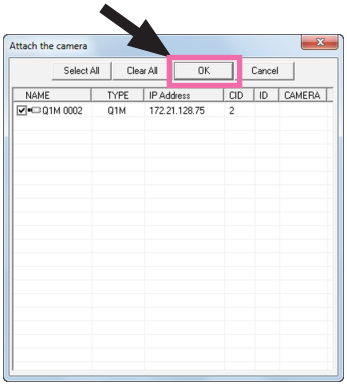
1 Press the camera connection.

- Press the camera connection button on Add Item.

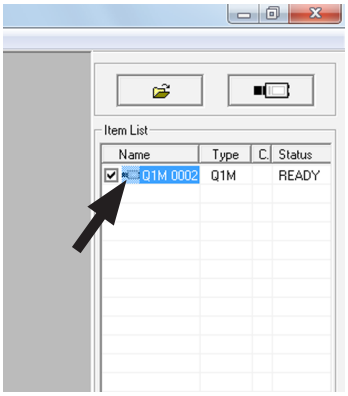


2 Select the connected camera from the list.

- Once the camera that can be connected is displayed on the list, select the camera to be used and press “OK”.



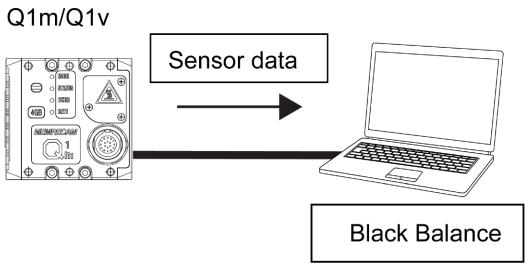
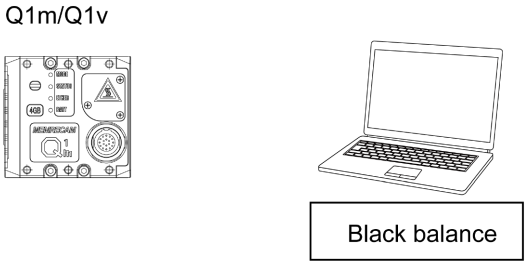
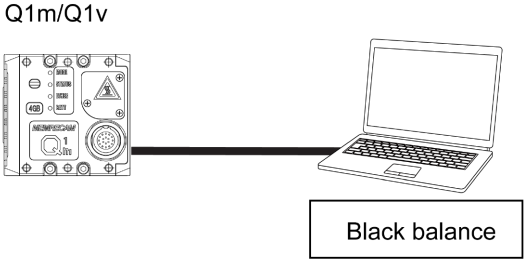
3 The connected camera is added to the item list.



Get the Black Balance

Get the black balance (noise and black level correction data) to correct the fixed pattern noise of the sensor.

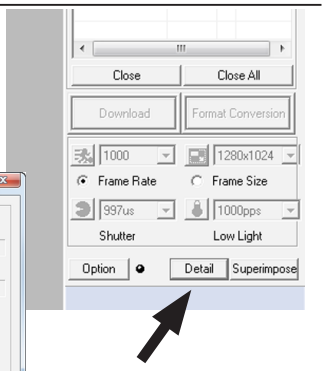
Noise can be generated on the image sensor used with the Q1/Q1v depending on the temperature of the sensor or the recording settings. This noise is called fixed pattern noise and has a pattern that differs for each sensor. The Q1m/Q1v reads the image sensor temperature and noise reduction is performed automatically according to the recorded image correction data but if a better image quality is desired, we recommend getting the black balance just before filming.

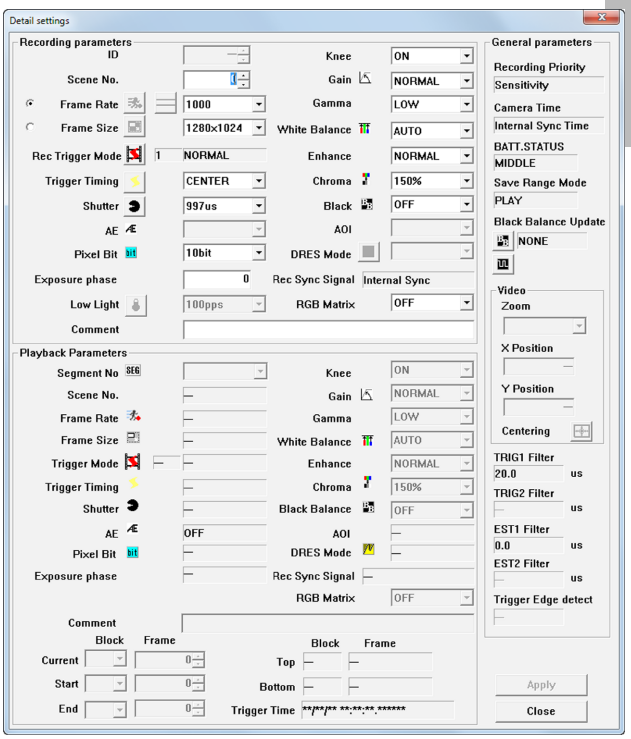
Get the black balance	 Reads the sensor data from the Q1m/Q1v and produces black balance (corrected data) during PC control.
If the camera is disconnected	 Even if disconnected from the Q1m/Q1v, the black balance obtained is saved in the control PC.
If reconnecting	 The saved black balance can be used.

Attention • The black balance is saved in the PC connected. Make sure to get the black balance if the camera is connected to another PC.

Get the Black Balance

	1	Set the "frame rate" and "frame size" for filming. • Set the recording settings for the camera. • Switch the camera to the stop state (STOP mode).
	2	Mount the lens cap to the lens to cover • Prevent light from reaching the lens.
	3	Press "Detailed Settings" to show the "Detail Settings" window. • The "Detail Settings" window will appear.





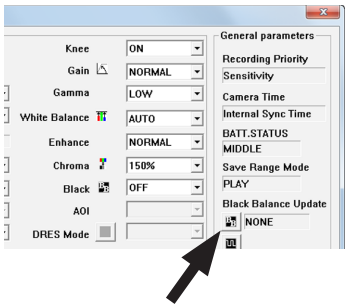
4 Press the update black balance button

- The following statuses are recommended.

  NONE: The black balance isn't ready.

  BUSY: Getting the black balance.

  VALID: Finished getting the black balance.

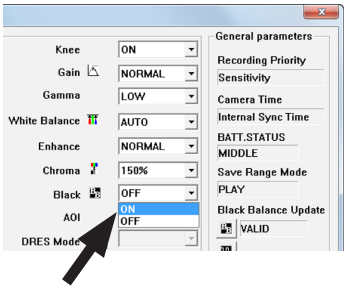


5 Enable/disable the black balance

- Select ON/OFF to enable/disable the setting.

  ON: Use black balance corrected data.

  OFF: Do not use black balance corrected data.



6 Remove the lens cap for recording

- Record using the black balance corrected data.

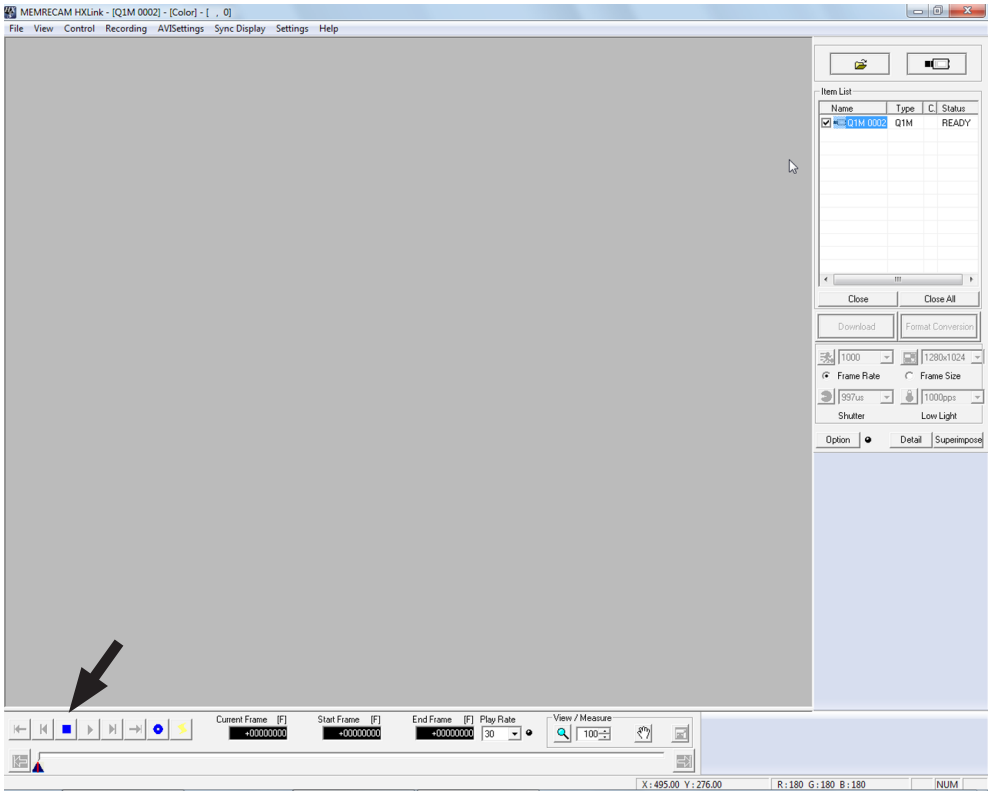
Attention

- Once the black balance is obtained, the previous black balance corrected data is overwritten.
- Make sure not to get the black balance before downloading the memory backup data.

Stop (STOP Mode)

After startup and connection from HXLink, the MEMRECAM Q1m/Q1v enters the STOP mode.

■ Switch to the STOP mode



Press the stop button during each mode

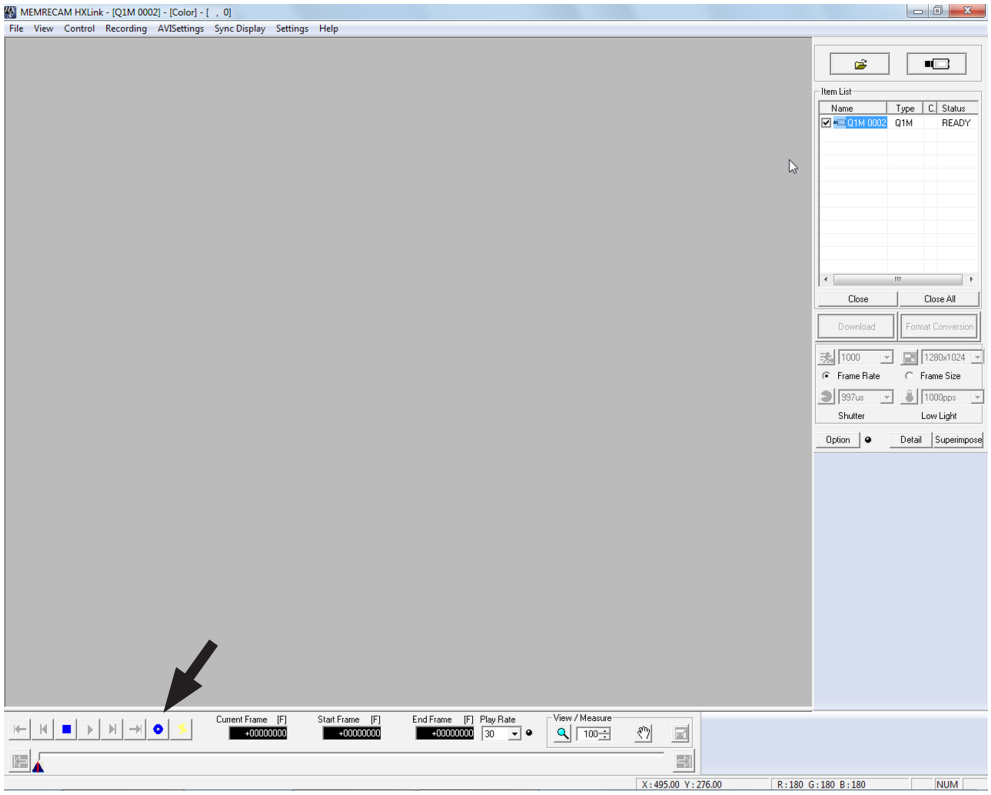
- The STOP mode can be access from other camera modes, including the VIEW mode and the ARM mode.
- The item list STATUS will show “READY”.
- MODE in the status LED will light up in blue.

CHECK • Images can be save in the STOP mode (⏭🕮 3-30).

Display Live Images (VIEW Mode)

Display live images in the VIEW mode for the recording settings or to adjust the camera and lens.

■ Switch to the VIEW Mode



Press the view/record button during each mode

- Switch to the VIEW mode from the STOP mode.
- Adjust the zoom or focus of the lens, the subject or the recording settings while looking at the live image in the VIEW mode.
- The item list STATUS will show "READY".
- MODE in the status LED on this unit will light up in white.

CHECK

- At the time of red blinking that STATUS is fast, a live image is not displayed with VIEW mode (⏭🕮 2-10).

Basic Recording Settings

Select the frame rate, frame size and shutter speed according to the image photographed.

■ Select the Frame Rate

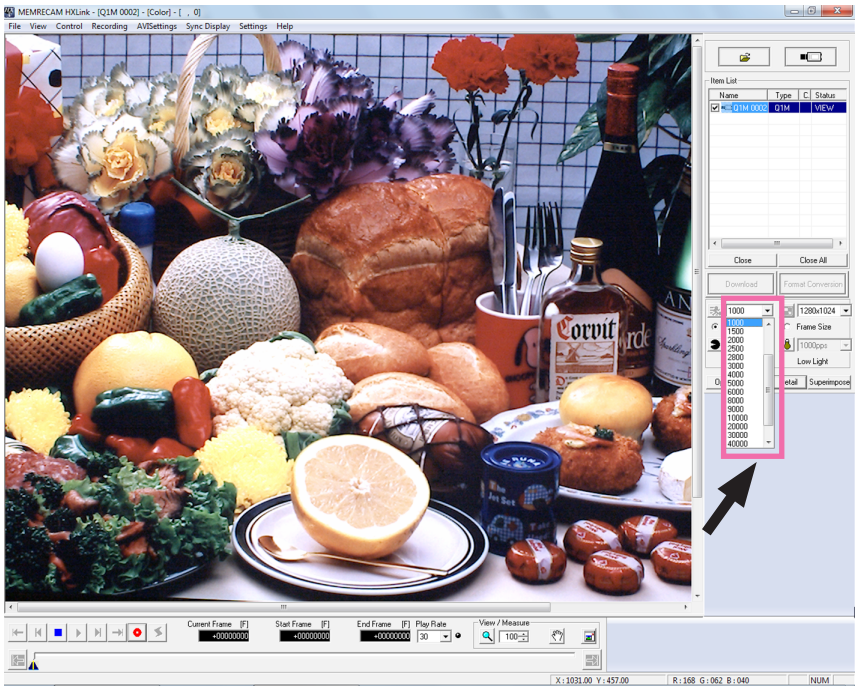
Sets the frame rate (frames per second) according to the image and subject filmed.

1 Access the VIEW mode

- Switch to the VIEW mode (⏭🕮 3-13).

2 Select the frame rate

- The frame size is limited by the frame rate. The frame size changes as the frame rate increases.
- Refer to (⏭🕮 3-16) for the frame rates and frame sizes that can be selected



CHECK

- If using black balance, get the black balance again after changing the frame rate. (⏭🕮 3-9)

■Select the Frame Size

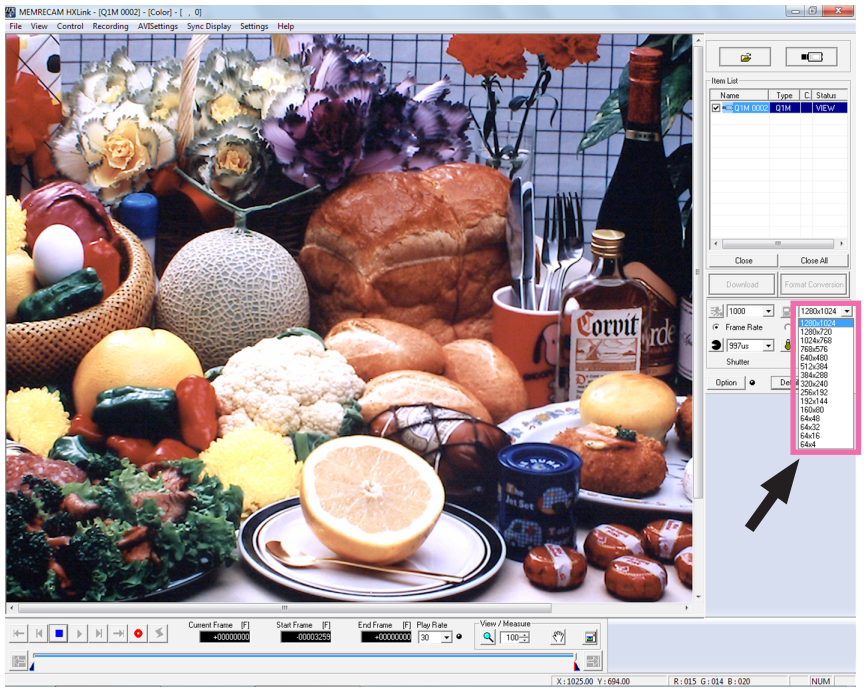
Sets the frame size according to the image and subject filmed.

1 Access the VIEW mode

- Switch to the VIEW mode (⏭🕮 3-13).

2 Select the frame size

- The frame rate is limited by the frame size. The frame rate changes as the frame size increases.
- Refer to (⏭🕮 3-16) for the frame sizes and frame rates that can be selected.



CHECK ●If using black balance, redo the black balance again after changing the frame size. (⏭🕮 3-9)

Frame Rate and Frame Size Q1m

Frame Rate (fps)	Frame Size														
	64 × 4 1280 × 4	64 × 16 1280 × 16	64 × 32 1280 × 32	64 × 48 1280 × 48	160 × 80 1280 × 80	192 × 144 1280 × 144	256 × 192 1280 × 192	20 × 240 1280 × 240	384 × 288 1280 × 288	512 × 384 1280 × 384	640 × 480 1280 × 480	768 × 576 1280 × 576	1280 × 720	1024 × 768 1280 × 768	1280 × 1024
50	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
60	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
100	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
250	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
500	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
1,000	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
1,500	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
2,000	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
2,500	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
2,800	√	√	√	√	√	√	√	√	√	√	√	√	√		
3,000	√	√	√	√	√	√	√	√	√	√	√	√			
4,000	√	√	√	√	√	√	√	√	√	√	√				
5,000	√	√	√	√	√	√	√	√	√	√					
6,000	√	√	√	√	√	√	√	√	√						
8,000	√	√	√	√	√	√	√	√							
9,000	√	√	√	√	√	√	√								
10,000	√	√	√	√	√	√									
20,000	√	√	√	√	√										
30,000	√	√	√	√											
40,000	√	√	√												
50,000	√	√													
87,000	√														

CHECK

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

Frame Rate and Frame Size Q1v

Frame Rate (fps)	Frame Size									
	64 × 8 640 × 8	64 × 16 640 × 16	64 × 32 640 × 32	64 × 64 640 × 64	128 × 96 640 × 96	192 × 144 640 × 144	56 × 192 640 × 192	384 × 288 640 × 288	512 × 384 640 × 384	640 × 480
50	√	√	√	√	√	√	√	√	√	√
60	√	√	√	√	√	√	√	√	√	√
100	√	√	√	√	√	√	√	√	√	√
250	√	√	√	√	√	√	√	√	√	√
500	√	√	√	√	√	√	√	√	√	√
1,000	√	√	√	√	√	√	√	√	√	√
1,500	√	√	√	√	√	√	√	√	√	√
2,000	√	√	√	√	√	√	√	√	√	√
2,500	√	√	√	√	√	√	√	√	√	√
2,800	√	√	√	√	√	√	√	√	√	√
3,000	√	√	√	√	√	√	√	√	√	√
4,000	√	√	√	√	√	√	√	√	√	√
5,000	√	√	√	√	√	√	√	√	√	√
6,000	√	√	√	√	√	√	√	√	√	√
8,000	√	√	√	√	√	√	√	√	√	√
9,000	√	√	√	√	√	√	√	√	√	
10,000	√	√	√	√	√	√	√	√		
15,000	√	√	√	√	√	√	√			
20,000	√	√	√	√	√	√				
30,000	√	√	√	√	√					
40,000	√	√	√	√						
50,000	√	√	√							
70,000	√	√								
87,000	√									

CHECK

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

■Select the Shutter Speed

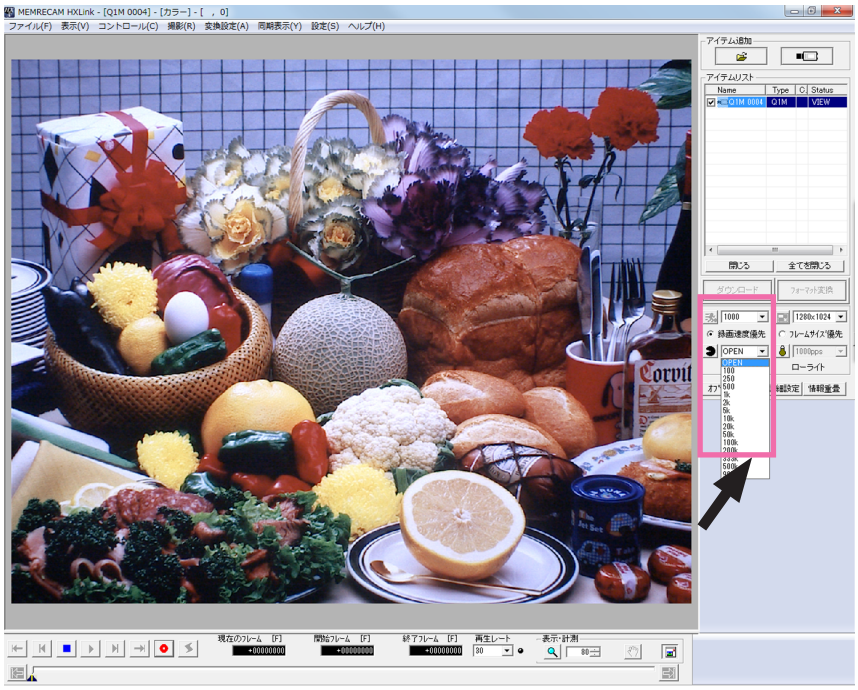
Sets the shutter speed according to the image and subject filmed.

1 Access the VIEW mode

- Switch to the VIEW mode (▸▸🕮 3-13).

2 Select the shutter speed

- The upper limit for the shutter speed is determined by the frame rate.



CHECK

- If using black balance, redo the black balance again after changing the shutter speed(▸▸🕮 3-9).

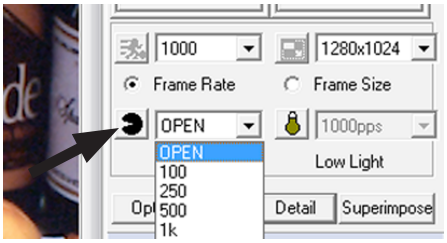
Shutter Speeds that can be Selected

Preset Shutter Speeds Q1m	OPEN, 1/100, 1/250, 1/500, 1/1,000, 1/2,000, 1/5,000, 1/10,000, 1/20,000, 1/50,000
Preset Shutter Speeds Q1v	OPEN, 1/100, 1/250, 1/500, 1/1,000, 1/2,000, 1/5,000, 1/10,000, 1/20,000, 1/50,000

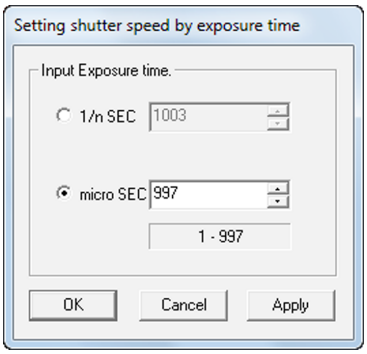
CHECK
- For speeds other than the preset shutter speeds, set using the custom shutter.

■ Select the Shutter Speed

1 Press the custom shutter button



2 Input the custom shutter time



CHECK
- The upper limit for the shutter speed is determined by the frame rate.
- If a value higher than the upper limit for the shutter speed is input the maximum value that can be set is determined.

Using the Low Light Function

There are times when a clear and crisp live image cannot be obtained in the VIEW mode with the set frame rate. Use the low light function to display an image that is brighter than the image filmed with the set frame rate, and easily check the angle of view and the focus.

Attention

- The low light function is only enabled for the image display in the VIEW mode. The image display during the ARM mode or the REC mode as well as the actual image recorded is not affected. The actual image is filmed at the set frame rate.

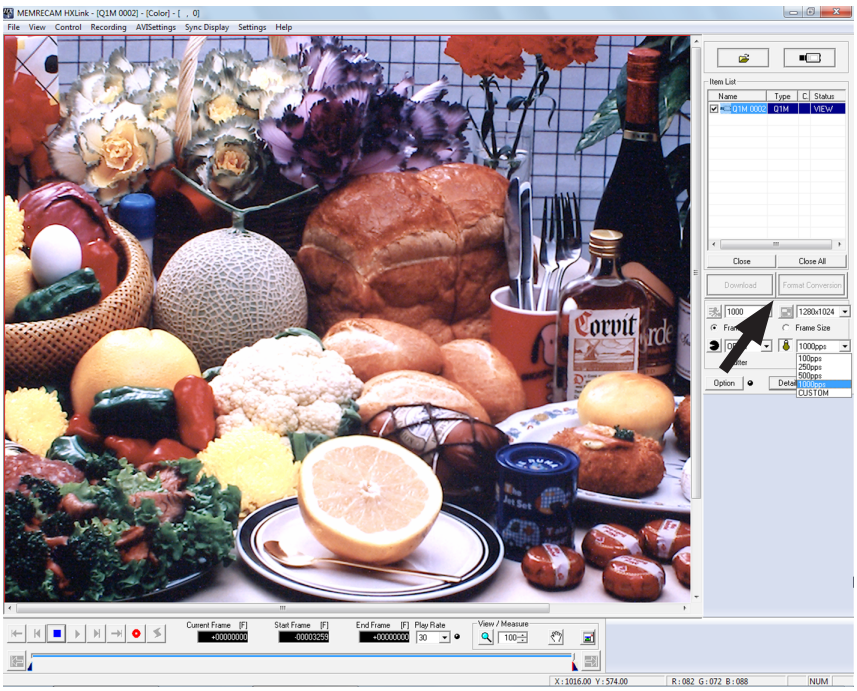
■ Select the Shutter Speed

1 Access the VIEW mode

- Switch to the VIEW mode (⏭🕮 3-13).

2 Click the low light button.

- This enables the low light mode.



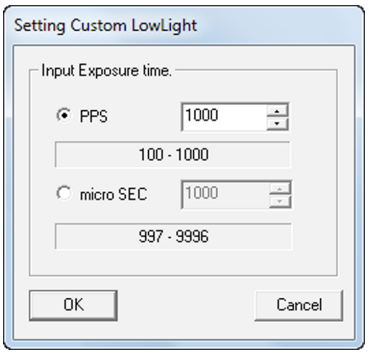
3 Select the brightness (exposure time) when the low light function is enabled.

- 100: Displays the live image at an exposure time of 1/100 sec (corresponds to a frame rate of 100 frames/sec, OPEN shutter)
- 250: Displays the live image at an exposure time of 1/250 sec (corresponds to a frame rate of 250 frames/sec, OPEN shutter)
- 500: Displays the live image at an exposure time of 1/500 sec (corresponds to a frame rate of 500 frames/sec, OPEN shutter)
- 1000: Displays the live image at an exposure time of 1/1000 sec (corresponds to a frame rate of 1000 frames/sec, OPEN shutter)
- CUSTOM: Custom exposure time

■ Custom Set the Low Light Exposure Time

1 Select CUSTOM from the pull down menu

2 Input the custom exposure time



Start Recording (ARM Mode)

After making the recording settings, switch to the ARM mode and start recording.

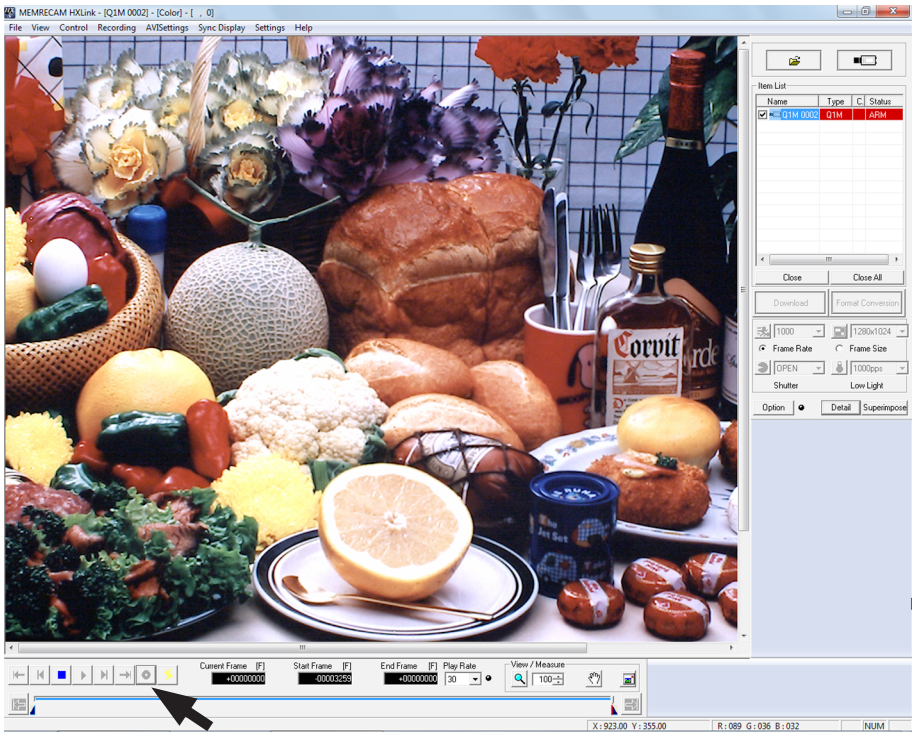
Attention

- Make sure to save the recorded image to the memory before switching to the ARM mode.
- Once switched to the ARM mode, the image saved in the memory is overwritten and deleted.
- Switch to the ARM mode after confirming whether or not deleting the image is acceptable.

■ Select the Shutter Speed

1 Press the view/record button in the VIEW mode

- Switching from the VIEW mode to the ARM mode is allowed.
- If switching from the STOP mode to the ARM mode, first switch to the VIEW mode and then switch to the ARM mode.
- The recording settings cannot be changed in the ARM mode.
- The item list STATUS will show "ARM".
- MODE in the status LED on this unit will light up in purple (magenta).

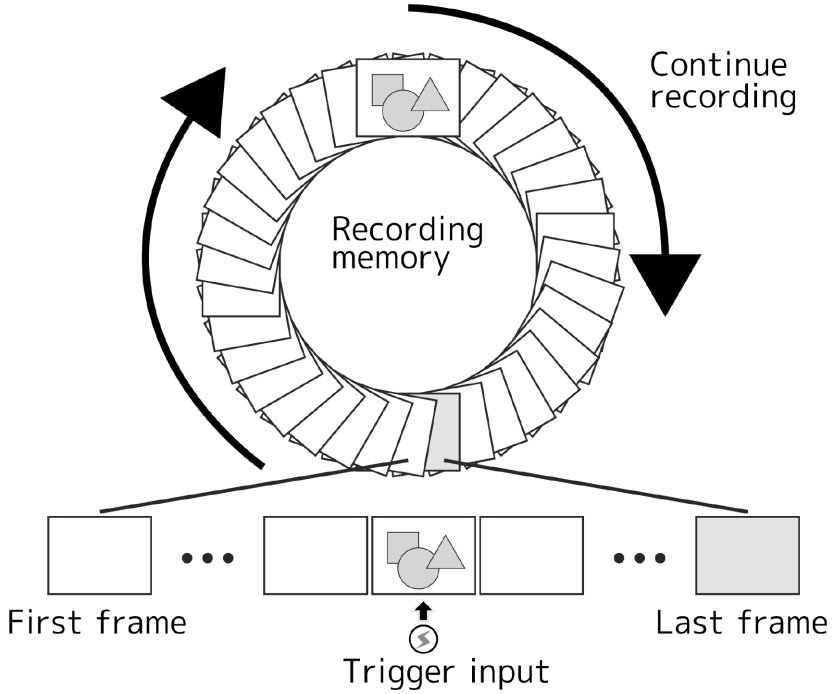


CHECK

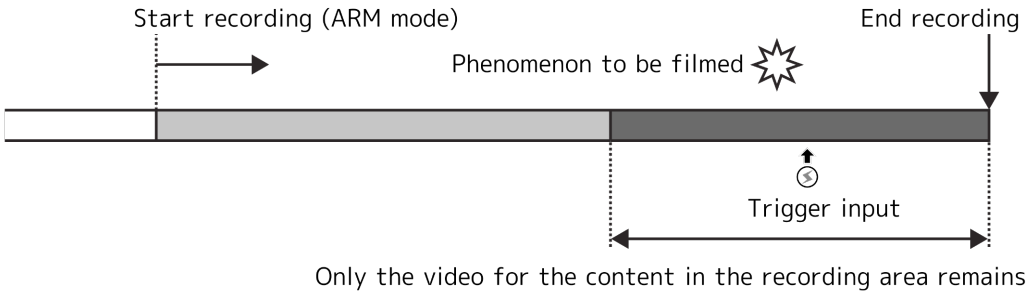
- Even in the ARM mode when the STATUS is fast red flashing, it will not be recorded (It becomes STOP mode (⏭🕮 3-12).

Ring Buffer

In the ARM mode, the Q1m/Q1v continues recording images to the memory. The memory has a cyclic structure (ring buffer), and once that section of the memory is full, the old images are erased in the order from the first image recorded and the new images are overwritten.



This operation continues until the trigger is input, when the overwrite recording is stopped according to the trigger input and trigger timing settings.



Trigger Input (REC Mode)

Input the trigger that matches the images to be photographed and then end recording.

■ Select the Shutter Speed

1 Press the TRIG button while in the ARM mode

- Switch to the REC mode.
- The STATUS on the item list will show REC.
- On his unit, the status LED for MODE lights up in orange during the REC mode.

Attention

- There is another way to input triggers other than HXLink.
  - Input TRIG with external trigger input signals.
  - Input TRIG with G sensor trigger.

Memory Backup

When the memory backup function is enabled, it is possible to save recorded images in the memory even if the power to the main unit is turned OFF by using the power from the AC adapter or internal battery.

Attention

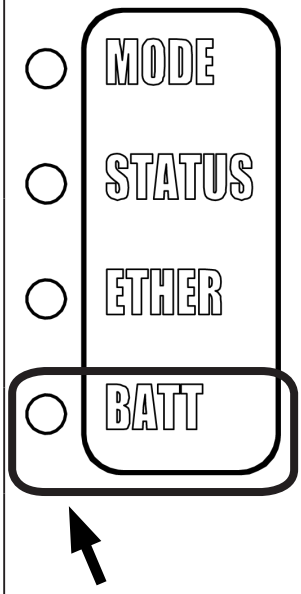
- If the AC adapter power is turned OFF when there is not enough charge in the battery, the recorded images will be lost.
- The memory backup is an additional function to prevent loss of images due to unexpected power outages. We strongly recommend turning the power off after saving any necessary images (⏩🕮 3-30).

■ Enable Memory Backup

The memory backup function is enabled after recording has started so even if the main unit power is turned OFF during recording, the power supply from the AC adapter or the internal backup battery (hereafter, battery) can save the images just recorded. If power is not supplied from the AC adapter, it switches to the memory backup battery.

Memory Backup Status LED

If memory backup is enabled, the MEM BACKUP status LED lights up or flashes.



Green: Memory backup enabled (AC power + battery) ● The memory backup is enabled (video saved in the memory) and if the battery is connected, BATT is lit. ● If the video is saved in the memory while the Q1m/Q1v is operating, BATT is lit. ● Battery charge: High
Flashing Green: Memory backup enabled (battery only) ● If the power to the Q1m/Q1v and the AC adapter is cut off and the memory backup functions with the battery, BATT flashes green. ● Battery charge: High
Orange: Memory backup enabled (AC power + battery) ● Battery charge: Medium
Flashing Orange: Memory backup enabled (battery only) ● Battery charge: Medium
Red: Memory backup enabled (AC power + battery) ● Battery charge: Low ● The memory backup time is shortened due to the low battery charge. Use the memory backup function after charging.
Flashing Red: Memory backup enabled (battery only) ● Battery charge: Low ● Plug in the AC adapter and charge the battery as soon as possible. Charging will start once power is supplied from the AC adapter. If not charged, the overdischarge protective function will start and the images in the memory will be lost.
OFF: Memory backup disabled ● If the memory backup is disabled (video not recorded in the memory), BATT is not lit.

Attention
● If the LED switches from flashing orange to red during memory backup with the battery, charge as soon as possible.

Playback (PLAY Mode)

Plays back the recorded image.

■ Playback

1 Press PLAY while in the STOP mode

- Switch to the PLAY mode from the STOP mode to play the recorded images.
- The item list STATUS will be PLAY.

Operating Buttons

Jump to the Start Frame

Displays the playback start frame.

Rewind 1 Frame

Rewinds 1 frame when in the STOP mode.

Stop

Stops the PLAY, VIEW and ARM modes and enters the STOP mode.

Play / Loop

Switches to the PLAY mode from the STOP mode. Keep pressing for loop playback.

Forward 1 Frame

Jumps forward 1 frame when in the STOP mode.

Jump to the End Frame

Displays the playback end frame.

View / Record

Switches to the VIEW mode from the STOP mode.
Switches to the ARM mode from the VIEW mode.

Trigger

Accesses the trigger in the ARM mode. The trigger frame is displayed in the STOP mode.

Designate the Start Frame

Sets the current frame as the playback start frame.

Designate the End Frame

Sets the current frame as the playback end frame.

Changing the Playback Speed

The playback speed can be changed. Reverse playback can also be set.

■ Changing the Playback Speed

Select the playback speed with the playback speed pull-down menu.

- The playback speed will be displayed and can be set.

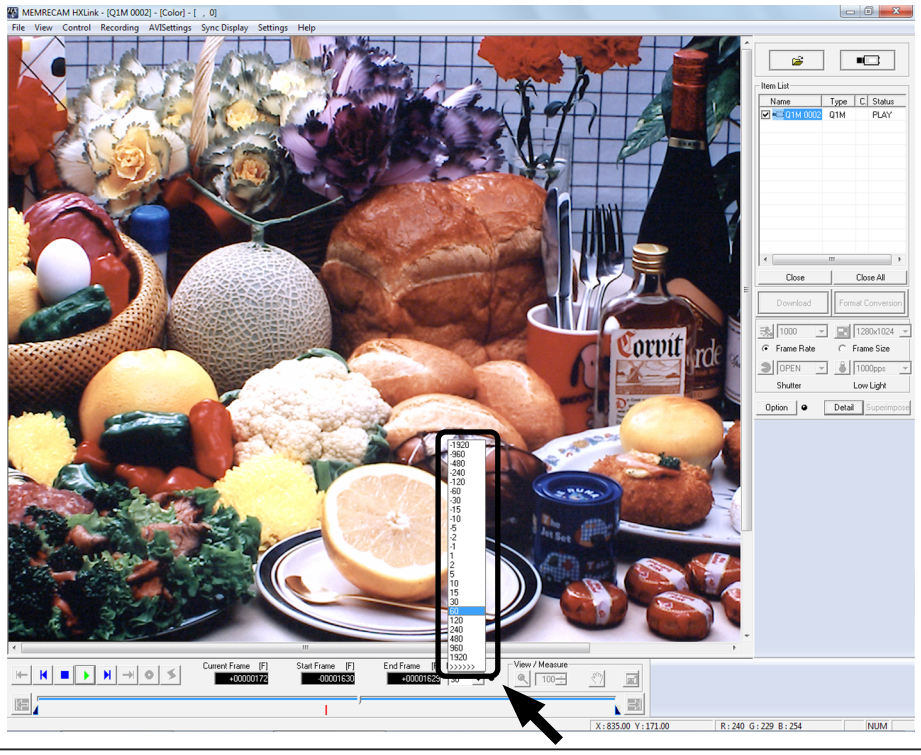


Table of Playback Speeds that Can Be Set

Playback Direction	Playback Speed (Unit: Frames/Second)
Play	1, 2, 5, 10, 15, 30, 60, 120, 240, 480, 960, 1920 >>>>>> : Playback speed is same as frame rate (real time play)
Reverse	-1, -2, -5, -10, -15, -30, -60, -120, -240, -480, -960, -1920

Saving Images

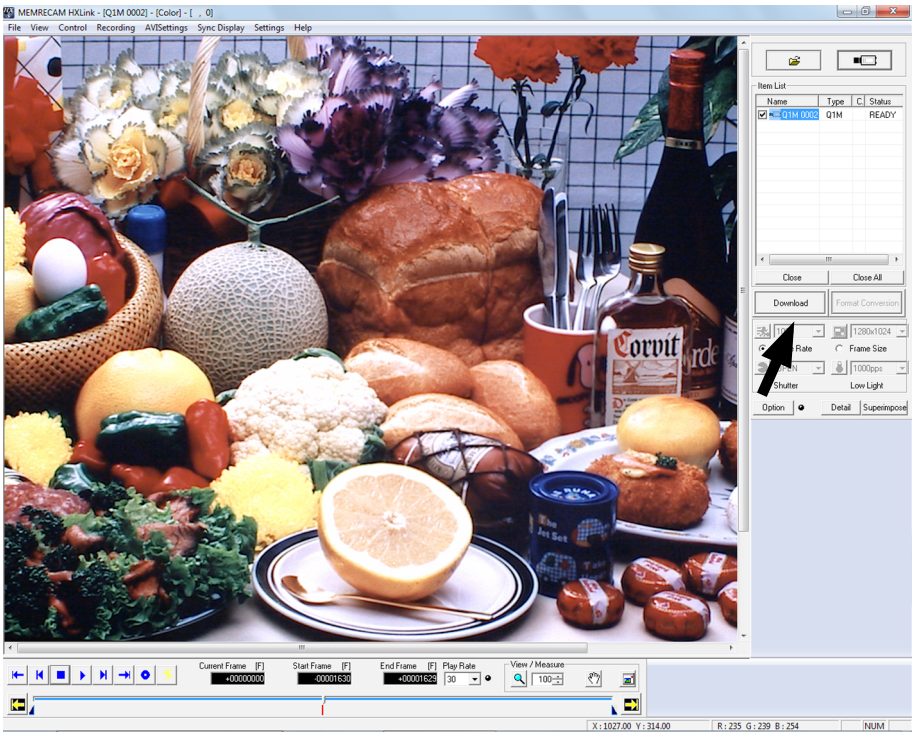
Download recorded images.

Attention • Do not set the black balance before saving the memory backup data.

1 Access the STOP mode

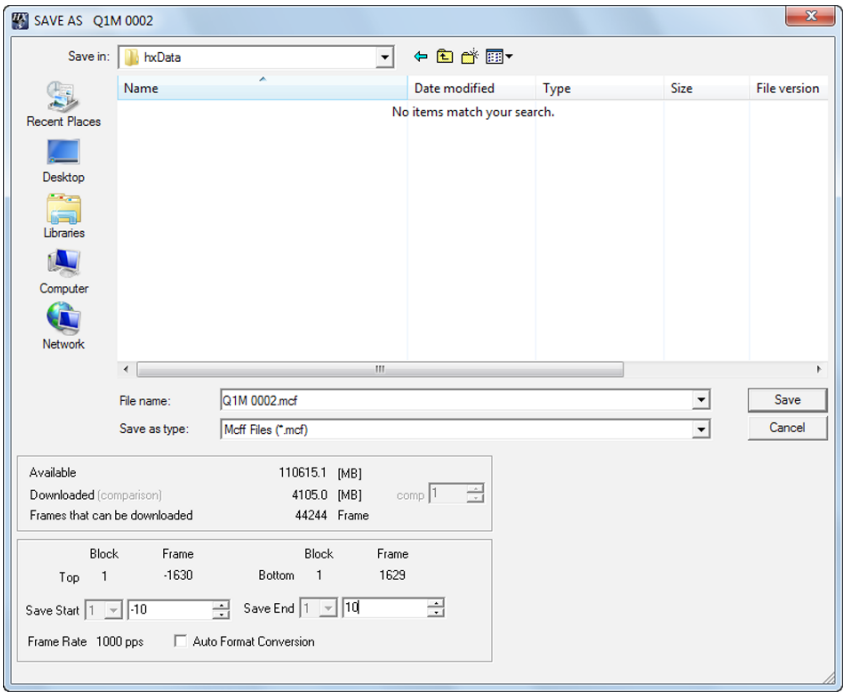
• Switch to the STOP mode (⏭🕮3-12).

2 Click on Download



x

3 “Save As” is displayed

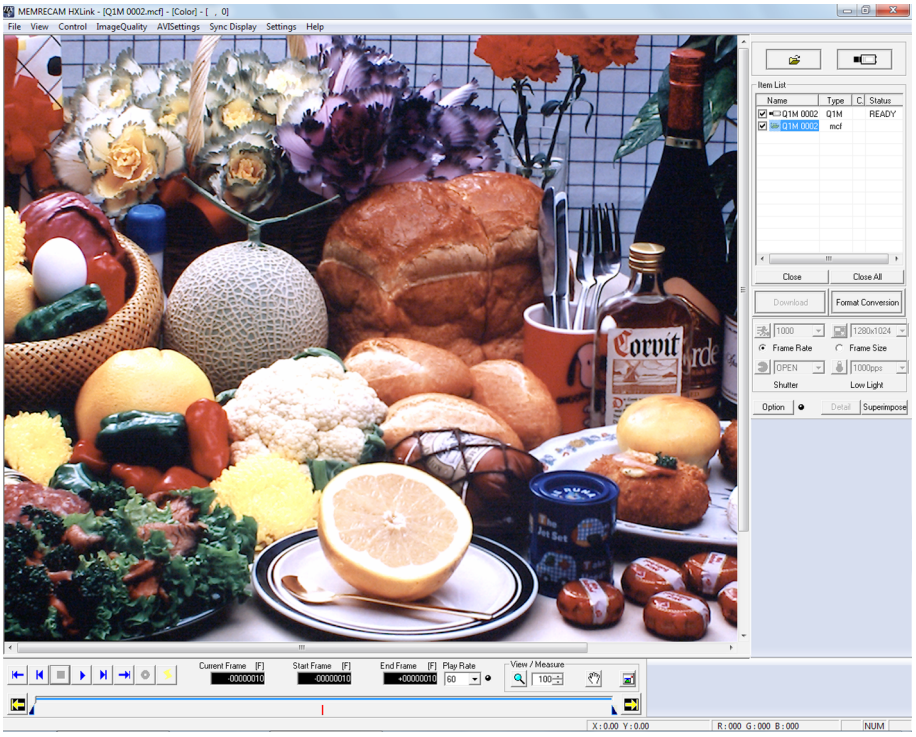


4 Click save to execute the save settings

- File Name: File name for saving
- Sabe as type: Type of file for saving
- Save Start : Start frame for range to be saved
- Save End: End frame for range to be saved
- Auto Fromat Conversion: Perform format conversion after saving

5 The file name is displayed once saving has been completed

- Playback is possible once the saved file is displayed.
- The saved file is added to the item list.



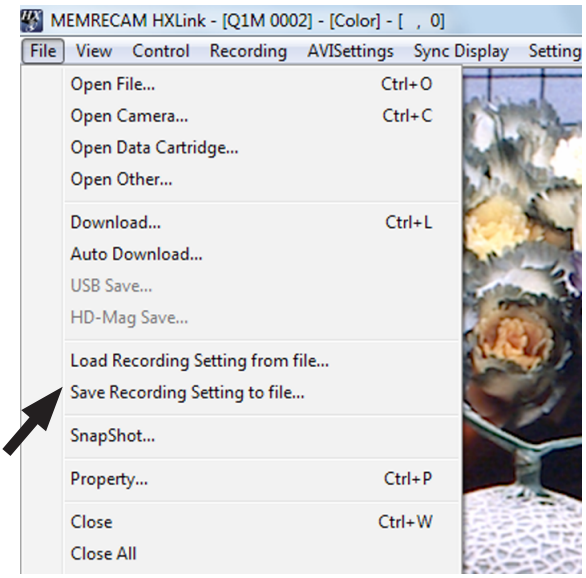
Load and Save Settings

With HXLink Ver. 1.85 or greater, the camera settings of Q1m/Q1v are automaticcaly saved/loaded in a PC. Or it can save specific settings (parameters) only by "Save Recording Settings to file" and load it by "Load Recording Setting from file" when you connect cameras next time. See the step-by-step procedure below.

■ Save the Settings

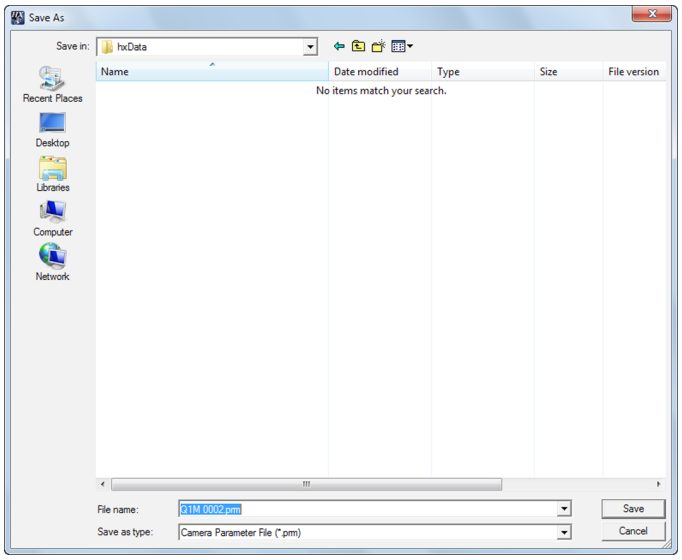
1 Select the save camera settings

- Select save camera settings from the file menu.



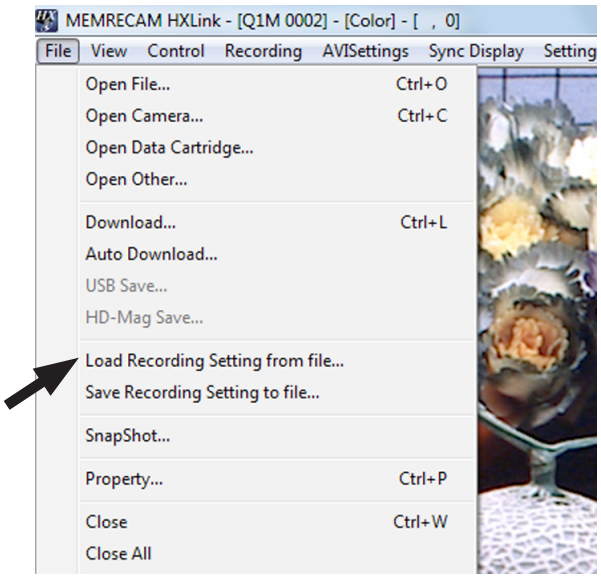
2 Input the settings file name and save

- Input the file name and save.



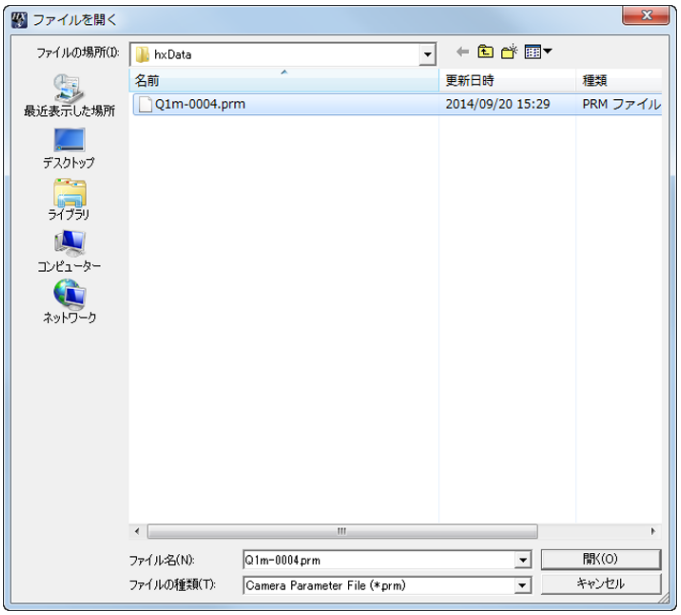
1 Select the camera settings to be loaded

- Select the camera settings to be loaded from the file menu.



2 Load the settings file

- Select the saved settings file to open.



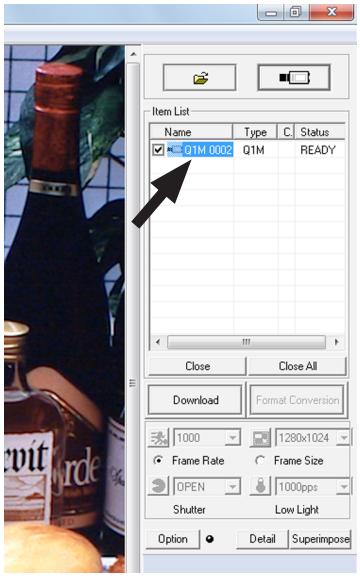
Disconnect the HXLink and Camera

Disconnect the Q1m/Q1v and HXLink.

■ Disconnect

1 Select the camera to be disconnected from the item list

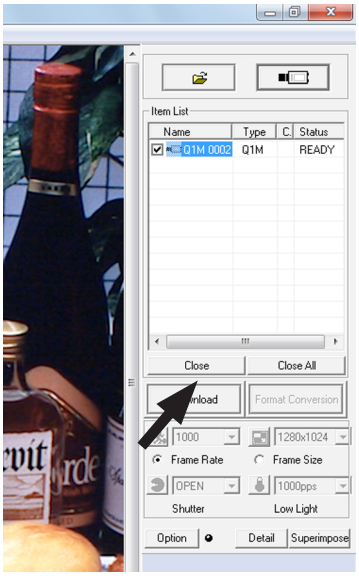
- Select the camera to be disconnected.



Close

2 Press close

- Press close under the item list.



CHECK

- All indications of cameras & image files in Item List will be closed at a time by pressing "Close All"

ResQ ADAPTER SYSTEM

If something abnormal occurs with the Q1m/Q1v, there are instances when the images on the camera can be saved externally.

The save of data in the following situation is possible by using ResQ ADAPTER SYSTEM.

- Data can be extracted in circumstances where operation via the Ethernet isn’t possible.
- Data can be extracted after segments have been eliminated.

- Contact the store or our company for more information.

G Sensor Trigger

The Q1m/Q1v has a G sensor trigger, where trigger input can occur by impact.

Attention

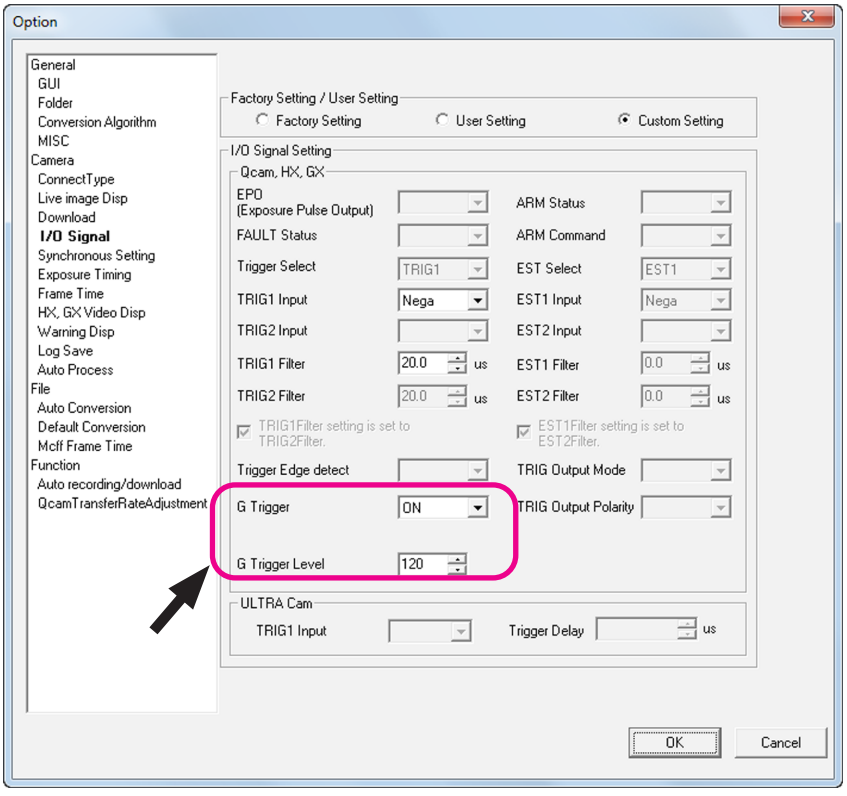
- The operating bandwidth for the G sensor is 1kHz.
- The internal G sensor detects values lower than the actual impact. When used, set the threshold with a margin of about 20%.
  Ex) With an impact environment of 150G -> Threshold value: 120G
- According to test conditions, there are instances that may not be detected by the G sensor.

■Set the G Sensor Trigger

Set the G sensor with HXLink. This describes the way to set it with the option of "Input/Output Signals".

1 Enable the G trigger with the option of input/output signals and input the threshold value.

- Turn the G trigger ON to enable.
- The units for the threshold values are G (gravitational acceleration).



Attention

- Make sure that the G sensor trigger is always OFF when not in use. Unexpected trigger input could occur due to impact or such.

High Sensitivity

In Q1m, becoming it is possible high sensitivity by using HXLink Ver1.91 or greater.
In Q1v, becoming it is possible high sensitivity by using HXLink Ver1.92 or greater.

Attention
- Sensitivity is at 1,000 frames / second (full resolution). Sensitivity may decrease depending on the shooting speed and resolution settings (⏭🕮 4-5).
- With high sensitivity, there are times when there is interference with the filming in the existing lighted environment. Perform test filming before recording.

■ Collective setting

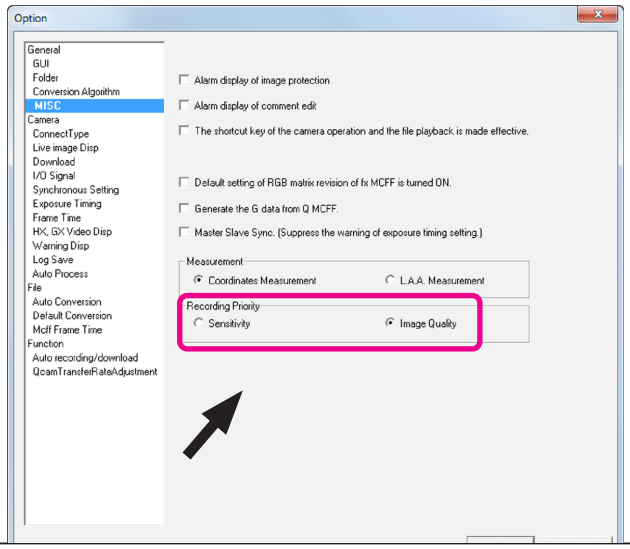
High sensitivity settings are performed in HXLink. Set using “MISC” under options.

CHECK
- The setting applies to all Q1m / Q1v connected with HXLink.

1 Access the STOP mode
- Switch to the STOP mode (⏭🕮 3-12).

2 Set with optional " Recording Priority "

Recording Priority	Camear	Sensitivity	
		Color	Mono
Sensitivity (High sensitivity)	Q1m	ISO 3,200	ISO 20,000
	Q1v	ISO 25,000	ISO 160,000
Image Quarity (Standard sensitivity, default setting)	Q1m	ISO 1,000	ISO 6,400I
	Q1v	ISO 8,000	ISO 50,000



3 Set to VIEW mode or ARM mode
- The setting becomes effective after transition to VIEW mode / ARM mode.

■Separate setting

In multi-camera operation, you can set light sensitivity individually at "Camera Environmental Setting" under "The list of camera setup"

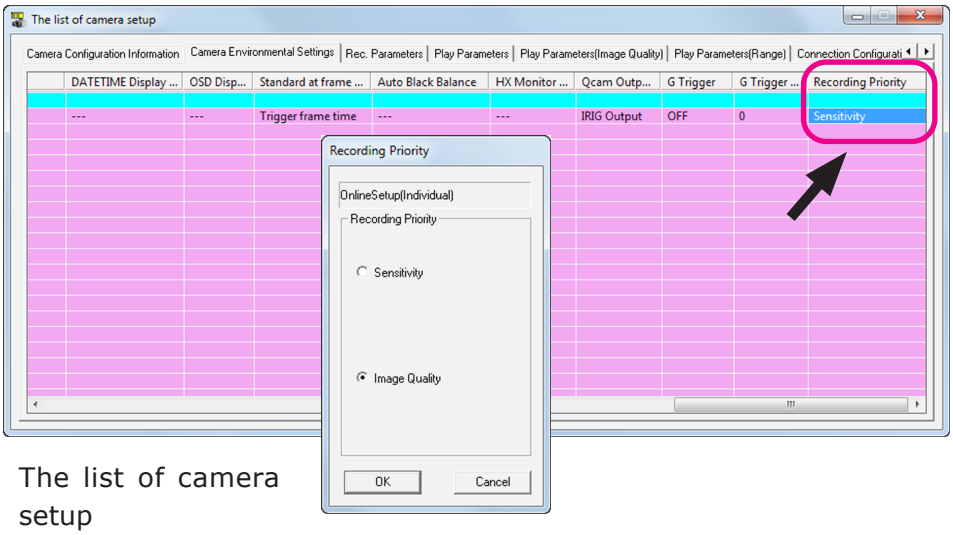
Attention • Separate setting is supported by HXLink Ver1.92 or later.

1 Access the STOP mode

• Switch to the STOP mode (⏭🕮 3-12).

2 Set light sensitivity at the "Camera Environmental Setting" under The listof camera setup.

Recording Priority	Camear	Sensitivity	
		Color	Mono
Sensitivity (High sensitivity)	Q1m	ISO 3,200	ISO 20,000
	Q1v	ISO 25,000	ISO 160,000
Image Quarity (Standard sensitivity, default setting)	Q1m	ISO 1,000	ISO 6,400I
	Q1v	ISO 8,000	ISO 50,000



The list of camera setup

Recoding Priority

3 Set to VIEW mode or ARM mode

• The setting becomes effective after transition to VIEW mode / ARM mode.

CHECK • You can make a batch setting at a time in "The list of camera setup". Refer to HX-Link Manual for details.

4

Specifications

Image Sensor

■ Image Sensor MEMRECAM Q1m

Format	Approximately 1/1.8 inch CMOS sensor (color/ B/W)
Pixel size	5.6μm square pixel
Valid Pixels	1280 × 1024 pixels (1,310,000 pixels)
Maximum Area	7.17 × 5.73 mm
Precision Around the Optical Axis	±0.33 mm

■ Image Sensor MEMRECAM Q1v

Format	Approximately 1/1.8 inch CMOS sensor (color/ B/W)
Pixel size	11.2μm square pixel
Valid Pixels	640 × 480 pixels (300,000 pixels)
Maximum Area	7.17 × 5.38 mm
Precision Around the Optical Axis	±0.33 mm

■ Frame Rates MEMRECAM Q1m

Preset Frame Rates	50, 60, 100, 250, 500, 1,000, 1,500, 2,000, 2,500, 2,800, 3,000,
	4,000, 5,000, 6,000, 8,000, 9,000, 10,000, 20,000, 30,000,
	40,000, 50,000, 87,000 fps

Attention

- There is no custom frame rate function.
- If selecting 250pps or less , the image quality will deteriorate with the shutter open (grainy image) but if you close the shutter, the image quality will improve.

■ Frame Rates and Valid Pixels MEMRECAM Q1m

Maximum Frame Rate (fps)	Valid Pixels			Horizontal-Vertical Ratio (Size)		Valid Image Area (mm)		
	Horizontal		Vertical			Horizontal		Vertical
2,000 or less	1280		1024	Full SXGA		7.17		5.73
At 2,500	1280	1024	768	Split	XGA 4:3	7.17	5.73	4.30
At 2,800	1280		720	HDTV720 16:9		7.17		4.03
At 3,000	1280	768	576	Split	Split 4:3	7.17	4.30	3.23
At 4,000	1280	640	480	Split	VGA 4:3	7.17	3.58	2.69
At 5,000	1280	512	384	Split	Split 4:3	7.17	2.87	2.15
At 6,000	1280	384	288	Split	Split 4:3	7.17	2.15	1.61
At 8,000	1280	320	240	Split	QVGA 4:3	7.17	1.79	1.34
At 9,000	1280	256	192	Split	Split 4:3	7.17	1.43	1.08
At 10,000	1280	192	144	Split	Split 4:3	7.17	1.08	0.81
At 20,000	1280	160	80	Split	Split	7.17	0.9	0.45
At 30,000	1280	64	48	Split	Split 4:3	7.17	0.36	0.27
At 40,000	1280	64	32	Split	Split	7.17	0.36	0.18
At 50,000	1280	64	16	Split	Split	7.17	0.36	0.09
At 87,000	1280	64	4	Split	Split	7.17	0.36	0.02

■ Frame Rates MEMRECAM Q1V

Preset Frame Rates	50, 60, 100, 250, 500, 1,000, 1,500, 2,000, 2,500, 2,800, 3,000,
	4,000, 5,000, 6,000, 8,000, 9,000, 10,000, 15,000, 20,000, 30,000,
	40,000, 50,000, 70,000, 87,000 fps

Attention

- There is no custom frame rate function.
- If selecting 250pps or less , the image quality will deteriorate with the shutter open (grainy image) but if you close the shutter, the image quality will improve.

■ Frame Rates and Valid Pixels MEMRECAM Q1m

Maximum Frame Rate (fps)	Valid Pixels			Horizontal-Vertical Ratio (Size)		Valid Image Area (mm)		
	Horizontal		Vertical			Horizontal		Vertical
8,000 or less	640		480	Full VGA 4:3		7.17		5.38
At 9,000	640	512	384	Split	Split 4:3	7.17	5.73	4.30
At 10,000	640	384	288	Split	Split 4:3	7.17	4.30	3.23
At 15,000	640	256	192	Split	Split 4:3	7.17	2.87	2.15
At 20,000	640	192	144	Split	Split 4:3	7.17	2.15	1.61
At 30,000	640	128	96	Split	Split 4:3	7.17	1.43	1.08
At 40,000	640	64	64	Split	Split 1:1	7.17	0.72	0.72
At 50,000	640	64	32	Split	Split	7.17	0.72	0.36
At 70,000	640	64	16	Split	Split	7.17	0.72	0.18
At 87,000	640	64	8	Split	Split	7.17	0.72	0.09

■ Sensitivity MEMRECAM Q1m

Color	ISO 1,000 (5760lx, F4, 1000 frames/sec, shutter 1/1000s, Digital Gain: NORMAL) ISO 3,200 (HXLink Ver1.91a or later, Recording Priority: Sensitivity) (1,800lx, F4, 1,000 frames/sec, shutter 1/1000s, Digital Gain: NORMAL)
B/W	ISO 6,400 (900lx, F4, 1000 frames/sec, shutter 1/1000s, Digital Gain: NORMAL) ISO 20,000 (HXLink Ver1.91a or later, Recording Priority: Sensitivity) (290lx, F4, 1,000 frames/sec, shutter 1/1000s, Digital Gain: NORMAL)

* The brightness of the subject is the brightness when the output signals reach 100% for the subject at a reflectance of 89% and the f-stop value is the aperture stop for the lens at that time.

Attention

- Above sensitivity is at 1,000fps (full resolution). In specific combination of framing rate and resolution, the sensitivity could be lower by Max. 20%.

■Sensitivity MEMRECAM Q1v

Color	ISO 8,000 (720lx, F4, 1000frames/sec, shutter 1/1,000s, Digital Gain: NORMAL) ISO25,000 (After HXLink Ver1.92a, Recording Priority: Sensitivity) (231lx, F4, 1,000 frames/sec, shutter 1/1000s, Digital Gain: NORMAL)
B/W	ISO 50,000 (115lx, F4, 1000frames/sec, shutter 1/1,000s, Digital Gain: NORMAL) ISO160,000 (After HXLink Ver1.92a, Recording Priority: Sensitivity) (36lx, F4, 1,000 frames/sec, shutter 1/1000s, Digital Gain: NORMAL)

* The brightness of the subject is the brightness when the output signals reach 100% for the subject at a reflectance of 89% and the f-stop value is the aperture stop for the lens at that time.

Attention

- Above sensitivity is at 1,000fps (full resolution). In specific combination of framing rate and resolution, the sensitivity could be lower by Max. 20%.

■ Shutter MEMRECAM Q1m

Shutter Method	Electronic shutter
Shutter Time Settings Method	Select from presets / Custom settings
Presets	OPEN, 1/100, 1/250, 1/500, 1/1,000, 1/2,000, 1/5,000, 1/10,000, 1/20,000, 1/50,000
Custom Settings	6 to 9,997μs (= 10ms = 1/100s) According to framing rate

■ Shutter MEMRECAM Q1v

Shutter Method	Electronic shutter
Shutter Time Settings Method	Select from presets / Custom settings
Presets	OPEN, 1/100, 1/250, 1/500, 1/1,000, 1/2,000, 1/5,000, 1/10,000, 1/20,000, 1/50,000
Custom Settings	6 to 9,997μs (= 10ms = 1/100s) According to framing rate

■ Lens Mount

Type of Mount	C Mount (there may be vignetting depending on the image resolution)

■ Timing Compatibility with Existing Products

Q1m/Q1v Standard Timing	Shutter exposure start timing (GX native)
fx Compatible Timing	Shutter exposure end timing (K4 compat)

Recorder

■ Recording Memory Capacity

Internal Memory Capacity	4GB / 8GB
Memory Segment Partitions	4GB model: 263MB×16, 527MB×8, 1.0GB×4, 2.1GB×2, 4.2GB×1 8GB model: 266MB×32, 532MB×16, 1.0GB×8, 2.1GB×4, 4.2GB×2, 8.5GB×1

■ Recording Bit Length

Image Sensor Output	12 bit
Recording bit per pixel	Select from 8 / 10 / 12 bits 12 bit: Records with 12 bit image sensor output (high quality image) 10 bit: Record upper 10 bits of image sensor output 8 bit: ompress and record the high-intensity part of the upper 10 bits of the image sensor output (long period of time)

■ Recording Time MEMRECAM Q1m

Q1m 4GB model No memory segmentation

Frame Rate (fps)	Valid Pixels		Recording Time (Sec)		
	Horizontal	Vertical	12 bit	10 bit	8 bit
2,000	1280	1024	1.07	1.28	1.6
2,500	1280	768	1.14	1.37	1.63
	1024	768	1.43	1.71	2.14
2,800	1280	768	1.09	1.3	1.63
3,000	1280	576	1.27	1.52	1.9
	768	576	2.12	2.54	3.18
4,000	1280	480	1.14	1.37	1.71
	640	480	2.29	2.74	3.43
5,000	1280	384	1.14	1.37	1.71
	512	384	2.86	3.43	4.29
6,000	1280	288	1.27	1.52	1.9
	384	288	4.24	5.08	6.36
8,000	1280	240	1.14	1.34	1.71
	320	240	4.58	5.49	6.87
9,000	1280	192	1.27	1.52	1.9
	256	192	6.36	7.63	9.54
10,000	1280	192	1.52	1.83	2.29
	256	192	10.17	12.21	15.26
20,000	1280	80	1.37	1.64	2.06
	160	80	10.99	13.19	16.49
30,000	1280	48	1.52	1.83	2.29
	64	48	30.53	36.64	45.8
40,000	1280	32	1.71	2.06	2.57
	64	32	34.35	41.22	51.53
50,000	1280	16	2.74	3.29	4.12
	64	16	54.96	65.96	82.45
87,000	1280	4	6.31	7.58	9.47
	64	4	126.36	151.63	189.54

Q1m 8GB model No memory segmentation

Frame Rate (fps)	Valid Pixels		Recording Time (Sec)		
	Horizontal	Vertical	12 bit	10 bit	8 bit
2,000	1280	1024	2.16	2.59	3.24
2,500	1280	768	2.3	3.46	3.46
	1024	768	2.88	1.71	4.33
2,800	1280	768	2.19	2.63	3.3
3,000	1280	576	2.56	3.08	3.85
	768	576	4.27	5.13	6.41
4,000	1280	480	2.31	2.77	3.46
	640	480	4.62	5.54	6.93
5,000	1280	384	2.31	2.77	3.46
	512	384	5.77	6.93	8.66
6,000	1280	288	2.56	3.08	3.85
	384	288	8.55	10.26	12.83
8,000	1280	240	2.31	2.77	1.71
	320	240	9.24	11.08	13.86
9,000	1280	192	2.56	3.08	3.85
	256	192	12.83	15.4	19.25
10,000	1280	192	3.08	3.69	4.62
	256	192	20.53	24.64	30.8
20,000	1280	80	2.77	3.32	4.15
	160	80	22.17	26.61	33.26
30,000	1280	48	3.08	3.69	4.62
	64	48	61.6	73.92	92.41
40,000	1280	32	3.46	4.15	5.19
	64	32	69.3	83.16	103.96
50,000	1280	16	5.54	6.65	8.31
	64	16	110.89	133.07	166.33
87,000	1280	4	12.74	15.29	19.11
	64	4	254.92	305.9	382.38

■Recording Time MEMRECAM Q1v

Q1v 4GB model No memory segmentation

Frame Rate (fps)	Valid Pixels		Recording Time (Sec)		
	Horizontal	Vertical	12 bit	10 bit	8 bit
8,000	640	480	1.16	1.39	1.74
9,000	640	384	1.28	1.54	1.93
	512	384	1.61	1.93	2.41
10,000	640	288	1.54	1.85	2.32
	384	288	2.57	3.09	3.86
15,000	640	192	1.54	1.85	2.32
	256	192	3.86	4.64	5.8
20,000	640	144	1.54	1.85	2.32
	192	144	5.15	6.18	7.73
30,000	640	96	1.54	1.85	2.32
	128	96	7.73	9.28	11.6
40,000	640	64	1.74	2.08	2.61
	64	64	17.4	20.88	26.1
50,000	640	32	2.78	3.34	4.17
	64	32	27.84	33.41	41.77
70,000	640	16	3.97	4.77	5.96
	64	16	39.78	47.73	59.67
87,000	640	8	6.4	7.68	9.6
	64	8	64.01	76.82	96.02

Q1v 8GB model　No memory segmentation

Frame Rate (fps)	Valid Pixels		Recording Time (Sec)		
	Horizontal	Vertical	12 bit	10 bit	8 bit
8,000	640	480	2.32	2.79	3.48
9,000	640	384	2.58	3.1	3.87
	512	384	3.22	3.87	4.84
10,000	640	288	3.1	3.72	4.65
	384	288	5.16	6.2	7.75
15,000	640	192	3.1	3.72	4.65
	256	192	7.75	9.3	11.62
20,000	640	144	3.1	3.72	4.65
	192	144	10.33	12.4	15.5
30,000	640	96	3.1	3.72	4.65
	128	96	15.5	18.6	23.25
40,000	640	64	3.48	4.18	5.23
	64	64	34.88	41.85	52.32
50,000	640	32	5.58	6.69	8.37
	64	32	55.8	66.97	83.71
70,000	640	16	7.97	9.56	11.95
	64	16	79.72	95.67	119.59
87,000	640	8	12.82	15.39	19.24
	64	8	128.29	153.95	19.24

■ Live Image Output

Output Method	PC live output with Ethernet GigE Vison Raw data of images the PC receives from MEMRECAM is converted to images for display
Refresh Rate	Depends on the network status between the MEMRECAM and the PC as well as the recording resolution (Default setting) ● About 15 frames/sec Q1m When the display resolution is 1280x1024 ● About 15 frames/sec Q1v When the display resolution is 640x480

■ Live Image Output

Recording Start Conditions	ARM Command (ARM from HXLink or such)
Recording End Conditions	Recording Trigger input (IF connector TRIG) REC Command (REC from HXLink or such) At the time of a rise in camera temperature abnormality (from HXLink, possible current temperature display by the property display of the camera)

■ Live Image Output

Normal Trigger	Normal recording trigger

■ Trigger Timing

START	The trigger point is about 5% before the beginning of the recording memory
CENTER	The trigger point is the center of the recording memory (About 50%)
END	The trigger point is about 5% before the end of the recording memory
CUSTOM	The trigger point is at a preset value (-100 to 100%) , set at 1% intervals

■ Simultaneous Recording Data

Recorded Scene Number	Closed caption method
Recording Trigger Mode Setting	Closed caption method
Frame Rate	Closed caption method
Frame Size	Closed caption method
Shutter Speed	Closed caption method
Recording Image Quality Settings	Closed caption method
Recording Comments	Closed caption method
Trigger Time	Closed caption method
Internal Standard Time (or IRIG-B Time)	Simultaneous Recording Method
Exposure Start Time	Simultaneous recording method, time stamp, minutes and seconds, 0.1μsec units
Exposure End Time	Simultaneous recording method, time stamp, minutes and seconds, 0.1μsec units
Frame Count	Simultaneous recording method, time stamp, memory address information
Trigger Time	Simultaneous recording method, time stamp, day/hour/min/sec, 0.1μsec units
Sequence Count	Simultaneous recording method, time stamp, recording sequence information
Signal Status	Simultaneous recording method, time stamp, Trigger, EST, Event, IRIG Lock, Sensor Flag bit identification
Recording Time	Simultaneous recording method, time stamp, date and time
Acceleration value	Simultaneous recording method, time stamp, X, Y, Z, the synthesis of X · Y · Z
Check Sum	Time stamp

*Closed caption method: Image and information recorded separately, synthesis display method, recorded in the system controller at the point of trigger input

*Simultaneous Recording Method: Method recording image and information together, recorded in image memory

*Time Stamp: Simultaneous recording data for each frame

System Control

■ Status LED (1/2)

LED	Status LED	Operation
MODE Camera Mode Display	Orange:	REC mode (during camera image memory recording after camera image output and trigger detection)
	Blue:	STOP/READY mode (memory image output. Playback or transmission mode immediately after startup)
	White:	VIEW mode (keeps the camera image output and contents recorded in the memory)
	Magenta:	ARM mode (deletes the camera image output and contents recorded in the memory and records the camera image in the memory)
	Not lit:	Power OFF or starting up
	Flashing:	Set to the EST mode and EST pulses are being input. Only for VIEW, ARM, REC modes.
STATUS Displays power ON, fail status	Lit green:	Normal state
	Lit red:	In failure (abnormal power voltage detected)
	Flashing red:	In failure (abnormal temperature detected) Slow Blinking : Caution Fast Blinking : Danger (unable to go to VIEW / ARM mode)
	Not lit:	Power OFF or starting up
ETHER Displays Ethernet connection status	Flashing orange:	Linking with 1000BASE-T
	Lit green:	Linking with 100BASE-TX
	Not lit:	Network not connected or power OFF
	* If transmitting by linking with 1000BASE-T, the orange is lit and the same LED flashes green, but the flashing green is darker than the lit orange so it is difficult to see.	

■ Status LED (2/2)

LED	Status LED	Operation
BATT	Lit green:	Backing up with external power, battery (full charge)
	Flashing green:	Backing up with battery (full charge)
	Lit orange:	Backing up with external power, battery (medium charge)
	Flashing orange:	Backing up with battery (medium charge)
	Lit red:	Backing up with external power, battery (low charge)
	Flashing red:	Backing up with battery (low charge)
	Not lit:	Backup OFF (No recording data)
	Alternating red and green:	Thermal shutdown started

■ Memory Backup

Function	Protects images just recorded when the power switch is turned OFF accidentally after recording is finished or protects the contents of the recorded images when the power cable is disconnected and the power is cut off during recording.	
Battery	Battery used:	Nickel metal hydride battery
	Model:	4 x 2 units
	Nominal capacity:	500mAh
	Life:	1 year (Target replacement of 1 year due to major changes in the ambient temperature or operating environment)
Backup Time	About 1 hour (8GB model)	
Backup Start Conditions	MEMRECAM main unit power is OFF after starting recording	
Battery Backup Start Conditions	MEMRECAM main unit DC input voltage is 19.0V after starting recording	
Charge Time	About 4 hours (from completely discharged state to fully charged state)	
Charge Start Conditions	If the main unit is supplied by external power (AC adapter or such)	
Battery Status Display	Display by LED on the rear panel	
	Red: low charge	
	Orange: medium charge	
	Green: full charge	

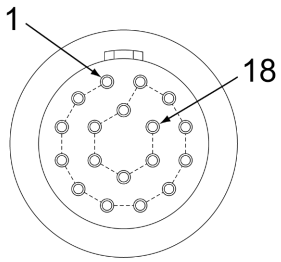
Input/Output Connectors

■ IF Connector

Application	Camera power input, Ethernet connection, EST input, trigger input, EPO output, power control	
Model	LEMO ECA.2B.318	
Plug	LEMO FGA 2B.318	
DC IN	Power voltage:	DC 20 to 32V
	Input power:	DC 20 to 32V
	Power consumption:	About 24W (ARM MODE, DC24V)
	Power protection	Reverse polarity The protection circuit by the electronic fuse (can't be replaced by the user)
		Overvoltage 35VDC, 1 minute
ETHER	1000BASE-T (IEEE802.3ab), isolation	
SYNC IN	Signal Level:	CMOS level, 5V pull-up, isolation L level:-0.5VDC (minimum applied voltage) to 1.2VDC H level:3.6VDC to 5.5VDC (maximum applied voltage) It IRIG-B is a DCLS (analog input is not allowed).
	Function:	Exposure start signal (EST) Synchronous signal (SYNC 1kHz, Continuous pulse synchronization) Timed synchronous signal (IRIG-B DCLS) input Set to EST mode and start exposure H -> L during the ARM or REC mode and photograph film one image Synchronous precision of 1.5μs or less Polarity inverting function During EVENT input, the signal level is recorded together with the image.

SYNC OUT	Signal level:	5VCMOS output, isolation
	Function:	IRIG / SYNC 1kHz / THRU / EPO / ARM Status output Falling (H -> L) : Start exposure Rising (L -> H) : End exposure
PWRCTL	Signal level:	CMOS level, 5V pull-up, isolation L level: -0.5VDC (minimum applied voltage) to 1.2VDC H level: 3.6VDC to 5.5VDC (maximum applied voltage)
	Function:	H: Power ON L: Power OFF No polarity inverting function
TRIG	Signal level:	CMOS level, 5V pull-up, isolation L level: -0.5VDC (minimum applied voltage) to 1.2VDC H level: 3.6VDC to 5.5VDC (maximum applied voltage)
	Function:	Trigger functions with H ->L, polarity inverting function

Pin Configuration



From the connector mating side

Pin Arrangement

Pin No.	Name	Direction	Function , Input/Output Level	Notes
1	MDI 0+	I/O	1000BASE-T Interface	
2	MDI 0-	I/O	1000BASE-T Interface	
3	MDI 1+	I/O	1000BASE-T Interface	
4	MDI 1-	I/O	1000BASE-T Interface	
5	MDI 2+	I/O	1000BASE-T Interface	
6	MDI 2-	I/O	1000BASE-T Interface	
7	MDI 3+	I/O	1000BASE-T Interface	
8	MDI 3-	I/O	1000BASE-T Interface	
9	SYNC IN	IN	CMOS	Isolation
10	SYNC IN RTN	IN	SYNC input signal return	Ground isolation
11	DC IN	IN	DC 24V input	
12	DC IN RTN	IN	DC 24V return	
13	TRIG IN	IN	CMOS, contact	Isolation
14	TRIG IN RTN	IN	TRIG input signal return	Ground isolation
15	SYNC OUT	OUT	CMOS	Isolation
16	SYNC OUT RTN	OUT	SYNC output signal return	Ground isolation
17	POWER CONT IN	IN	CMOS	Isolation
18	POWER CONT RTN	IN	POWER CONT input signal return	Ground isolation
shell	FRAME GND	-	Frame ground	

Shape, Environment, Precision, Application Standards, Supplies

■ Shape

Exterior dimensions (W×H×D)	About W62×H62×D65mm (Excluding connector, protruding parts and mounting parts)
Main unit weight	About 470g (Camera unit only. Excluding mounting cap and such)
Mounting screws	4 each M4 depth of 5mm on the top, bottom, left and right 4 each M4 depth of 7mm on the front and back

■ Environment

Operating temperature and humidity	0 to 40°C, 30 to 80%RH (no condensation)
Storage temperature and humidity	-10 to 60°C, 20 to 80%RH (no condensation)
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
Impact	Half sine, 10msec, 150G, 6 axes total 1,000 times

■ Precision

Precision of recording time	±0.01% or less The value of the reciprocal of the frame rate (frequency) for a given time (1 sec or more) is applied as the precision time.
Method of inspecting the precision of recording time	Measures the frequency of the EPO signals output from the REMOTE connector with the frequency counter for the recording rate within a given amount of time (1 sec or more).

■ Application Standards

Safety standard	EN60950
Electromagnetic compatibility	EN55032, EN55024, EN55035, FCC Part 15 Class A, KN32, KN35

■ Supplies

Memory backup battery	Depletion rate: 1 year (Target annual replacement due to the great discrepancies from ambient temperature and use environment) Replacement method: Replacement by our company

Main Attachments, Options

■ Q-Cam Cable (sold separately)

Length	0.5 m	
Plug	Camera side:	LEMO FGA.2B.318 Clip to prevent cable from disconnecting (locking clip) Included
	ETHER:	RJ45 receptacle
	SYNC IN:	BNC receptacle
	TRIG:	BNC receptacle
	SYNC OUT:	BNC receptacle
	PWCTL:	BNC receptacle
	DC IN:	LEMO PHG.1B.303

■ Q-Cam Extension Cable (sold separately)

Length	1m, 3m, 5m, 7m, 10m	
Cable diameter	Approximately 9.2mm	
Plug	Camera side:	LEMO FGA.2B.318 Clip to prevent cable from disconnecting (locking clip) Included
	Q-Cam Cable Side:	LEMO PHA.2B.318

■ Q1 KIT (sold separately)

CD-ROM	HXLink CD-ROM:	Control software HXLink CD-ROM
	Q1m/Q1v User's Manual:	Camera user's manual electronic version (this document)
	HXLink User's Manual:	HXLink detailed user's manual, electronic version
Brochure	HXLink Quick Start Guide:	HXLink simple user's manual

■ Control Software HXLink

PC	IBM PC compatible (DOS/V)
OS	Microsoft Windows 7 Ultimate / Professional (32/64bit) Windows 8 /8.1 Pro (32/64bit) Windows 10 Pro (32/64bit , after HXLink Ver 1.92a)
CPU	Core2 Duo 2GHz or equivalent
Memory	2GB or more
Display	Full color 1024 x 768 or higher
HDD	600MB or more (not including image data storage area)
Network	1000BASE-T / 100BASE-TX
Optical drive	CD-ROM drive

Attention
- In Windows 10, please be sure to install the GigE Vision Filter Driver of HXLink 1.92a or later CD.

■ AC Adapter (sold separately)

External dimensions (W×H×D)	Approximately 76 × 43.7 × 184 mm (not including connector)	
Weight	Approximately 1.1 Kg	
Operating temperature and humidity	0 to 60°C, 5 to 95%RH (no condensation)	
Storage temperature and humidity	-40 to 85°C, 5 to 95%RH (no condensation)	
Connector	Camera side:	LEMO FGG.1B.303
	AC side:	AC3 pin connector
Input	AC100 to 240V, 47 to 63Hz	
Output	DC24V, maximum 5A	

■ Carrying Case (sold separately)

External dimensions (W×H×D)	336 × 300 × 148 mm
Weight	Approximately 1.9kg

■ Anti-G Camera Holder (sold separately)

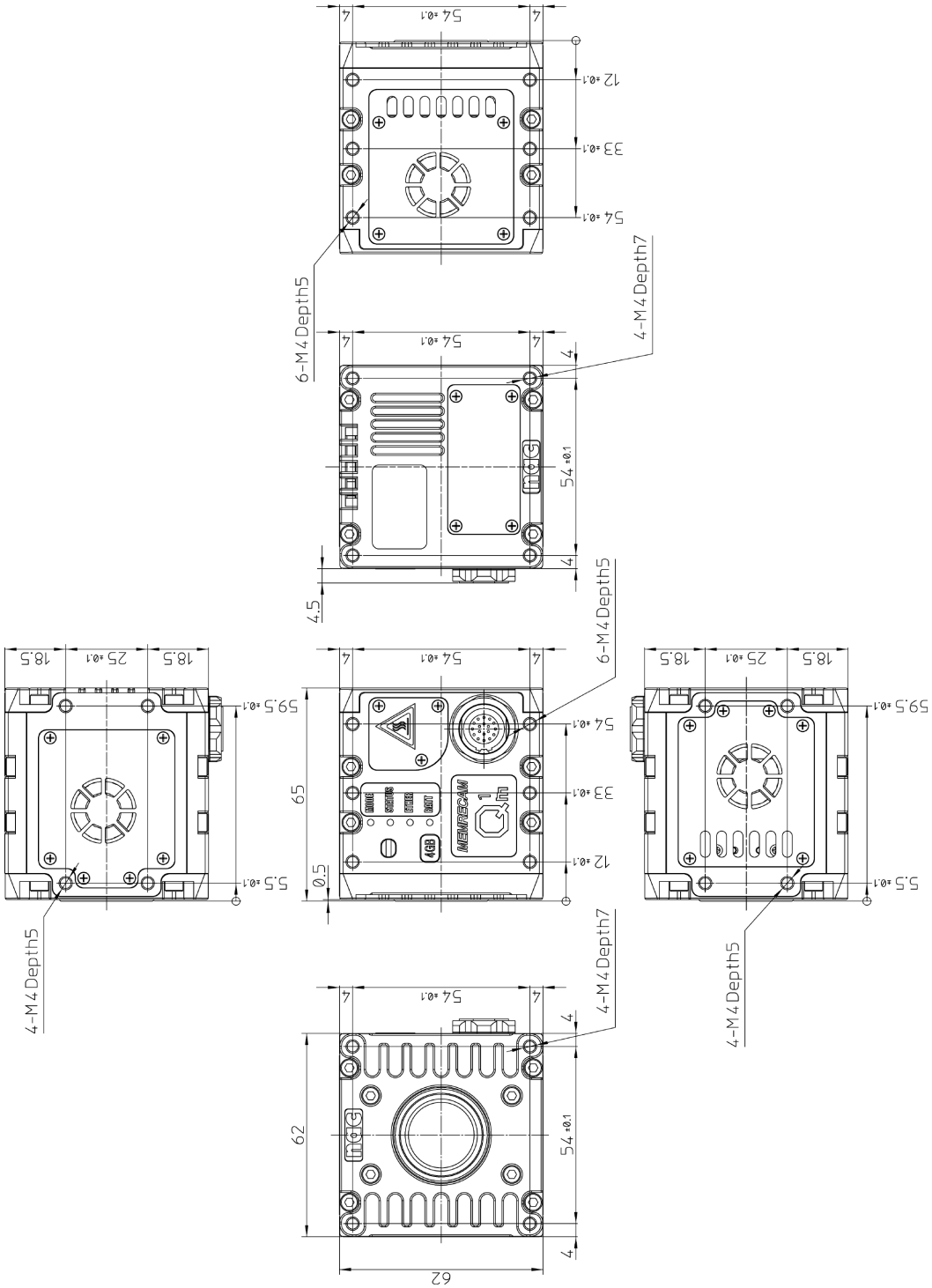
External dimensions (W×H×D)	110 × 17.5 × 110 mm (excluding protruding parts)
Weight	Approximately 260g

■ Lens Holder (sold separately)

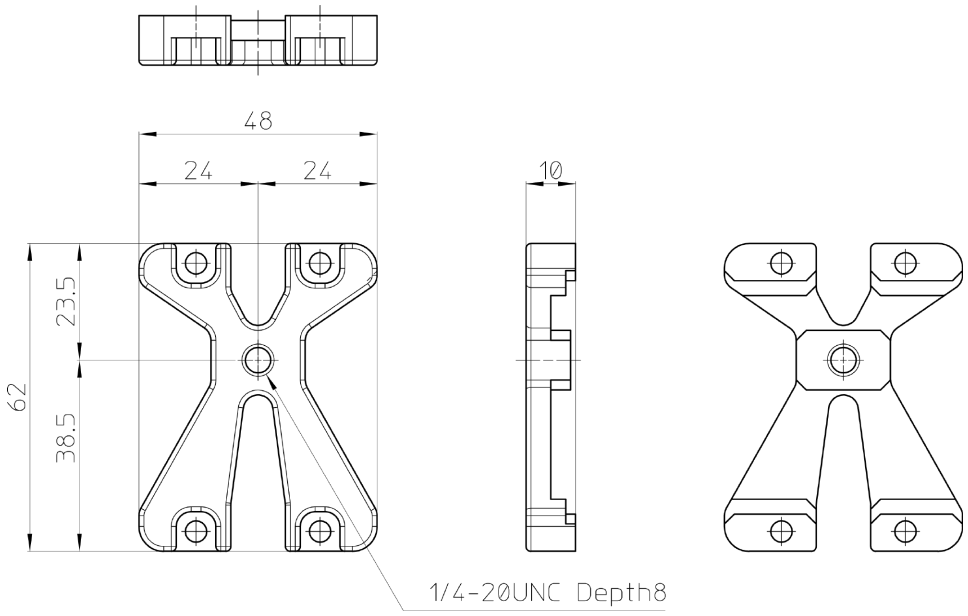
External dimensions (W×H×D)	62 × 62 × 26 mm (excluding protruding parts)
Weight	Approximately 55g

Dimensional Drawings

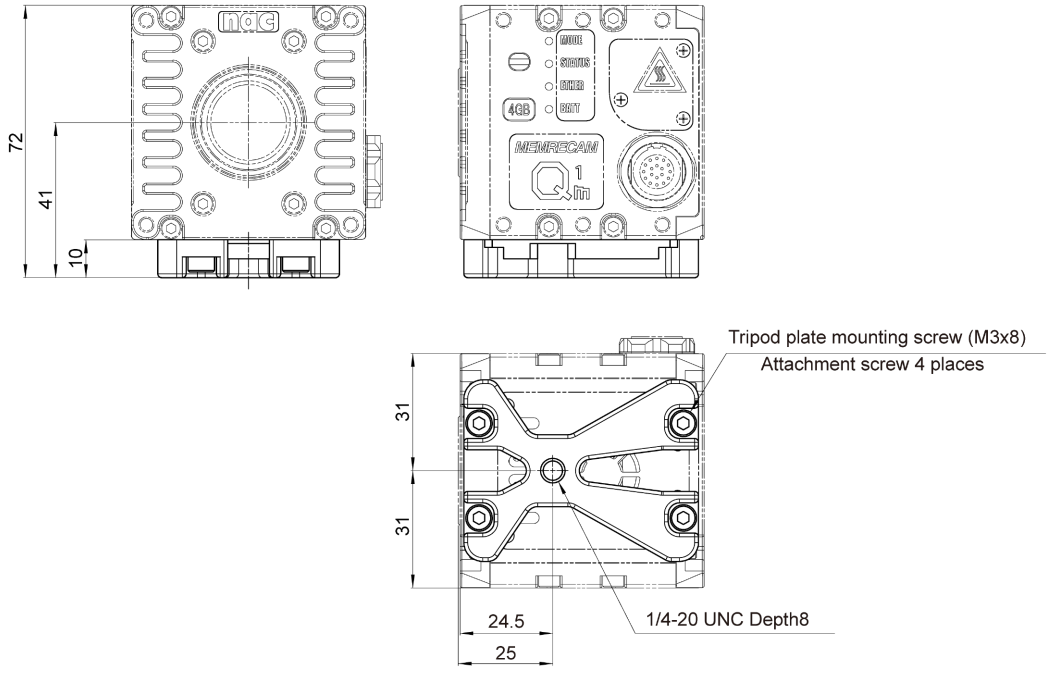
■ MEMRECAM Q1m, Q1v
(Same shape for both Q1m, Q1v)



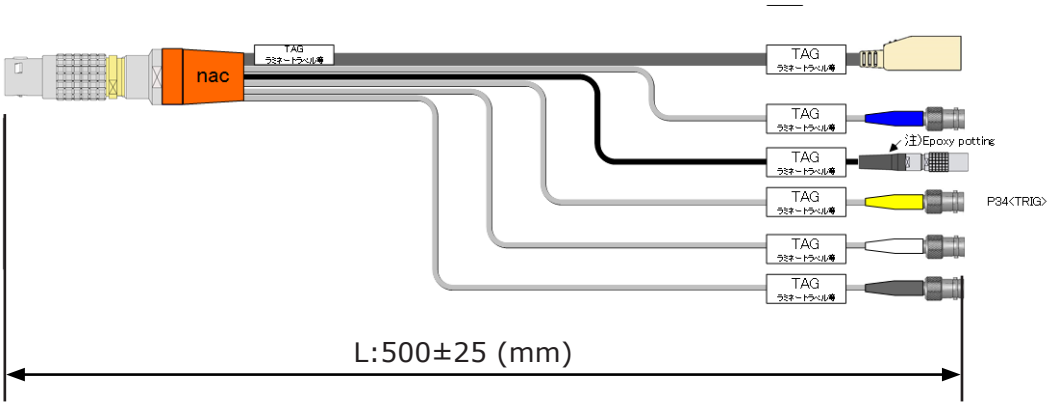
■ MEMRECAM Q1m, Q1v Tripod Plate



Q1m/Q1v installed (the figure shows the Q1m)

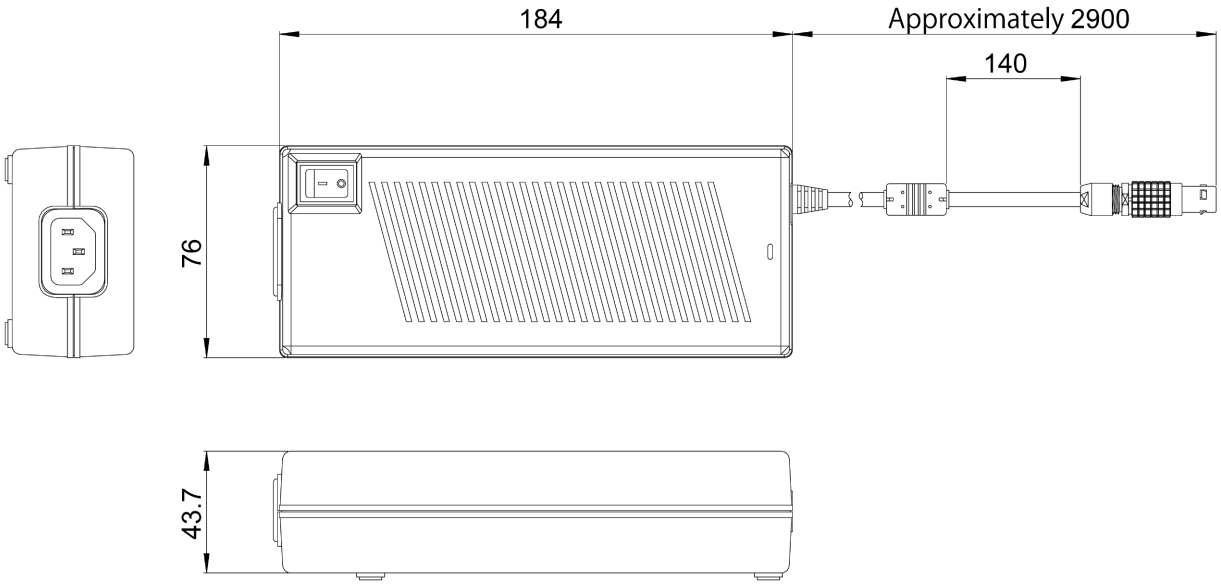


■ Q-Cam Cable

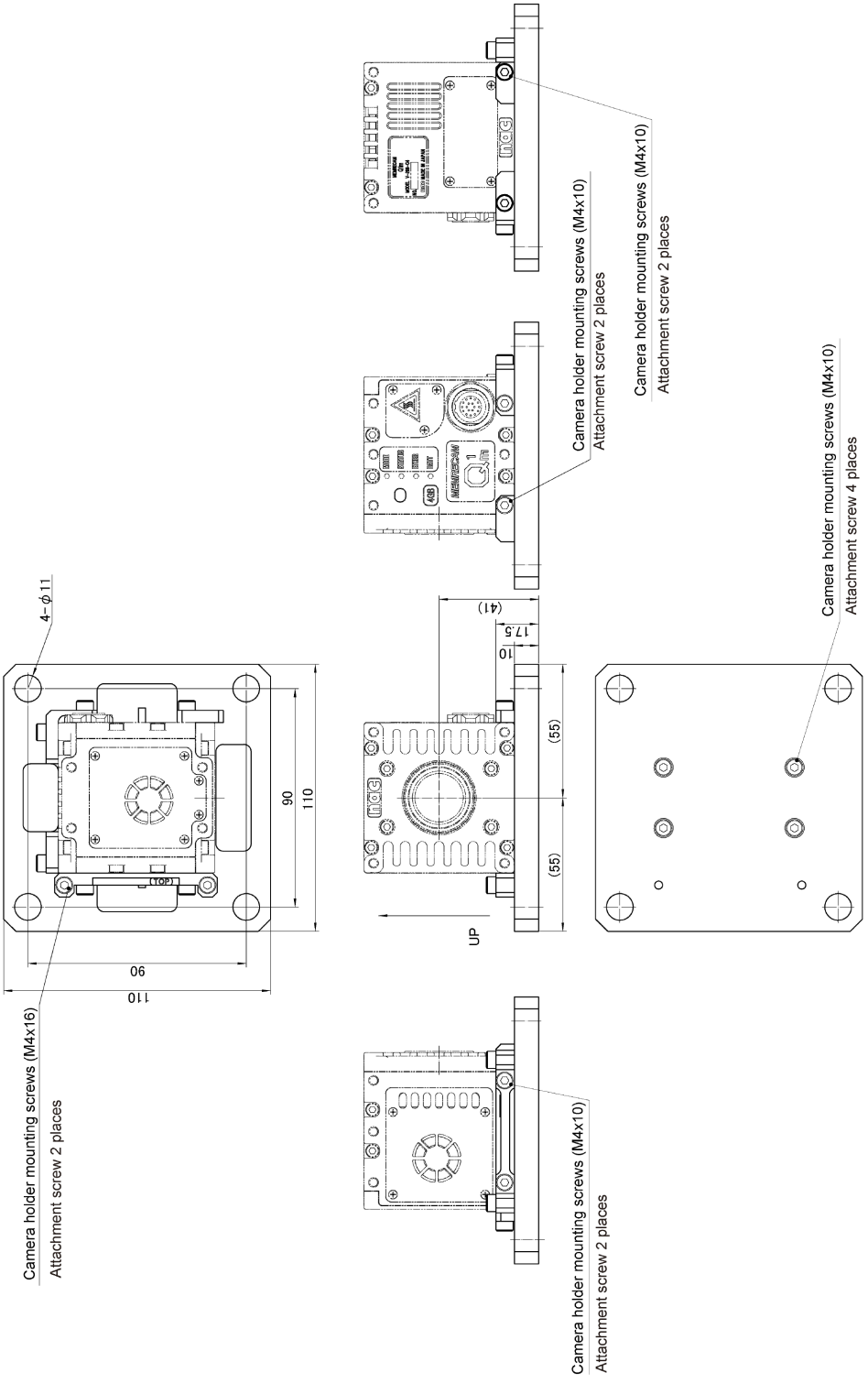


■ Q-Cam Extension Cable

■ AC Adapter Dimensional Drawing

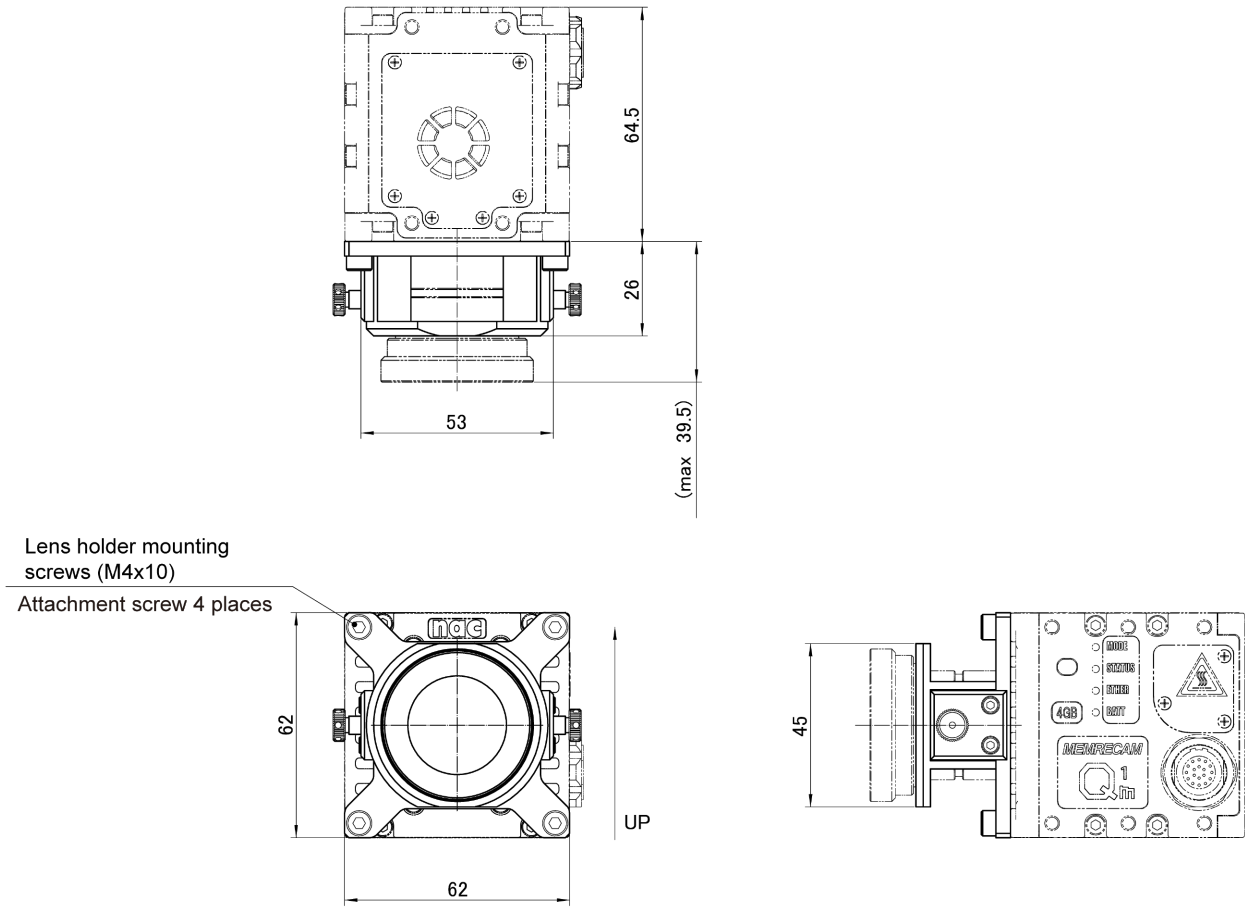


■Anti-G Camera Holder Dimensional Drawing



(00375)H

■Lens Holder Dimensional Drawing



Attention • Lenses compatible with the lens holder

	Produced by KOWA	LM3NC1M (f=3.5mm)
		LM5JC1M (f=5mm)
	Produced by RICOH	FL-CC0814-2M (f=8mm)

5

Options

(00375)H

Features of the Options

High-speed recording under various environment is possible by attaching an option to MEMRECAM Q1m/Q1v.

Q1m/Q1v Power Battery Option

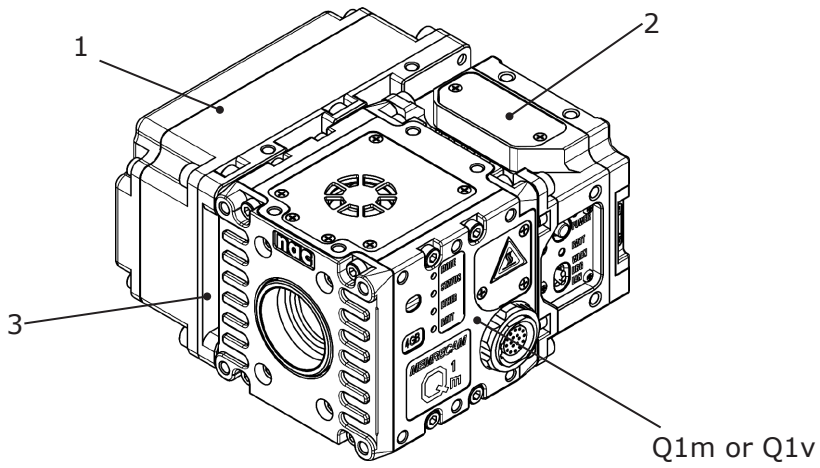
The MEMRECAM Q1m/Q1v can be powered by a battery.

Check the Components of the Options

The following is included in the option.

Please check whether you gather all.

■ Q1m/Q1v Power Battery Option



1 Q1m/Q1v power battery

2 Adapter unit

3 Mounting plate

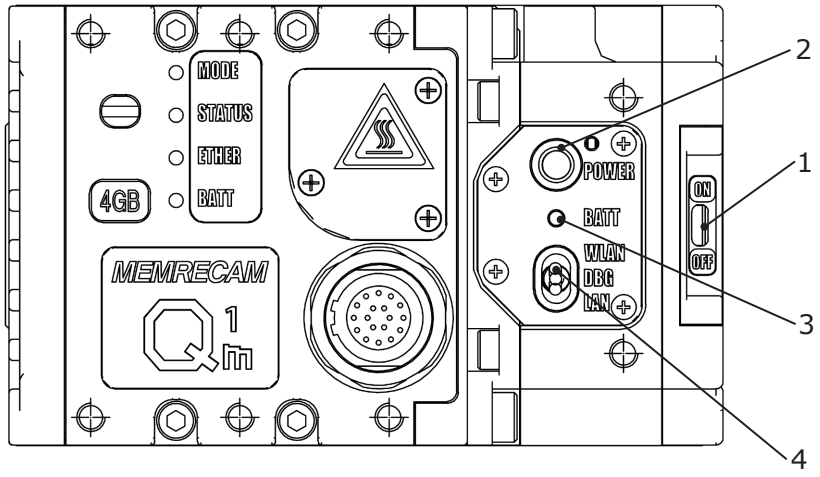
Attention

- Do not remove the adapter unit and the mounting plate.
- The Q1m/Q1v power battery is charged by connecting to the Q1m/Q1v. There is no battery charger.

External Appearance and Names of Each Part

External Appearance and Names of the Options

Right Side



1 Battery switch

2 POWER switch

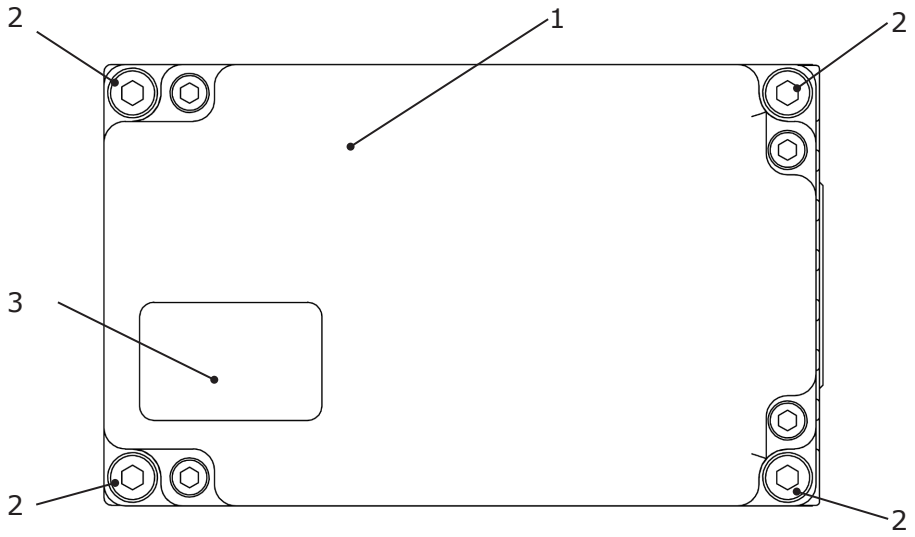
3 Battery LED

4 LAN switch (Set to LAN)

Attention

- If the LAN switch is set to WLAN or DBG, it cannot be connected with HXLink. Make sure to connect to LAN.

Left Side



1 Q1m/Q1v power battery

2 Battery securing screw (cap bolt with hexagon socket)

3 Name plate

Connect the Equipment and Cables

This describes the connections for peripherals for recording such as the power as well as the cables.

Attention
- Q1m/Q1v installation method (⏭🕮 2-2).
- Lens installation and removal (⏭🕮 2-4).

■ Input/Output Connector

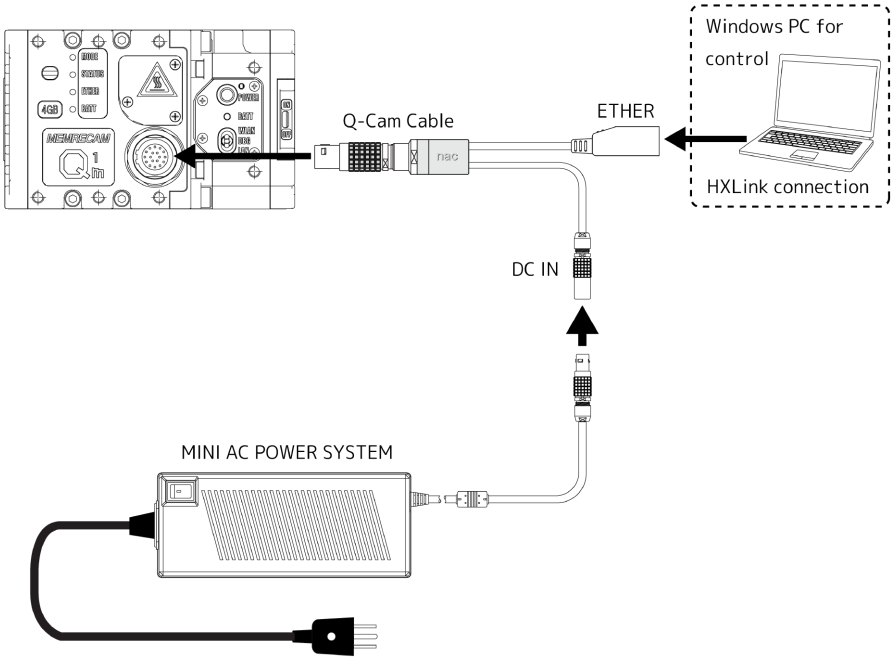
Connector	Branched Connector	Input/Output Signal
IF (*1)	DC IN	Power input
	ETHER	1000BASE-T Ethernet
	SYNC IN	Exposure start signal (EST) Synchronous signal (SYNC 1kHz, Continuous pulse synchronization) Timed synchronous signal (IRIG-B DCLS) input
	SYNC OUT	IRIG (DCLS) / SYNC 1kHz / THRU/ EPO /ARM Status output
	PWRCTL	Power control input
	TRIG IN	Trigger signal input

*1 Q-Cam cable required (⏭🕮 1-4).

*2 If an external power source is not connected when the Q1m/Q1v power battery is used and the supply from the external power source is less than about 20V, the power supply source switches to the Q1m/Q1v power battery.

There may be slight changes according to the differences in individual batteries and the effect of the ambient temperature so use this as a guideline.

■ Connection Diagrams

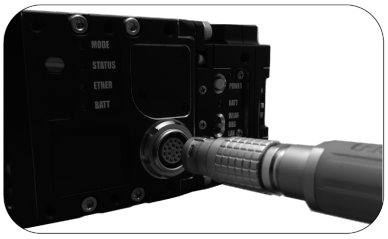


Attention

- The Q-Cam cable, MINI AC POWER SYSTEM, and control Windows PC are sold separately.
- The Q-Cam cable in the figure is shown with sections of the connectors omitted.

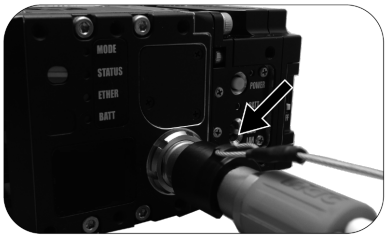
■ Connecting the Q-Cam Cable

Connect the Q-Cam cable, sold separately.



1 Connect the Q-Cam cable to the camera

- Align the red mark on the Q-Cam cable plug with the IF connector on the camera and press firmly until it "clicks".



2 Install the locking clip

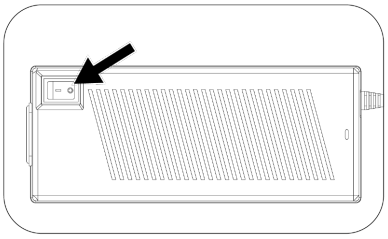
- Install the locking clip to prevent the cable from falling out.

Attention

- Make sure to install the locking clip when using in environments with impact or vibration.
- The Q-Cam cable is a dedicated cable for the Q1m/Q1v. It cannot be used with the MEMRECAM GX series or the HX series.

■ Connecting the Power Source

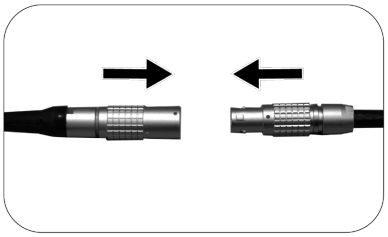
Connect the MINI AC POWER SYSTEM (AC adapter), sold separately.



1 Turn the power switch OFF
- Turn the power switch on the AC adapter OFF.

2 Connect the AC cable to the AC adapter

3 Connect the AC cable to a power outlet

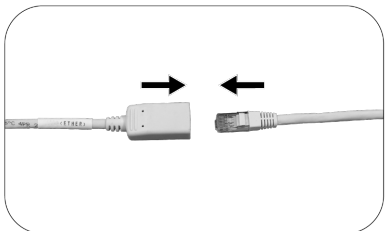


4 Connect the DC cable to the Q-Cam cable
- Align the red mark on the DC plug on the AC adapter with the DC IN connector of the Q-Cam cable on the camera and press firmly until it "clicks".
- When unplugging the DC plug, hold the shell of the plug and pull straight out.

Attention
- If unplugging the DC cable or AC cable, make sure to turn off the power to the AC adapter.
- Do not open the cover of the AC adapter. There are places that generate high voltage and are dangerous.
- Make sure to ground the unit. Electrical shock may occur if used without being grounded.
- If connecting to an outlet with a 3P-2P conversion plug, make sure to connect with the grounding wire of the conversion plug on the outside.
- This is an AC adapter dedicated for the MEMRECAM Q1m/Q1v so do not use on other devices.

■ Connecting the Q-Cam Cable

If connecting to a PC, connect using an Ethernet.



1 Connect the Ethernet cable to the Ethernet connector of the Q-Cam cable. Connect to a Windows PC

- Connect the Ethernet cable to the Ethernet (RJ45) connector of the Q-Cam cable. Connect the other Ethernet cable to the Windows PC.

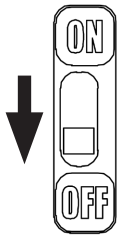
Attention

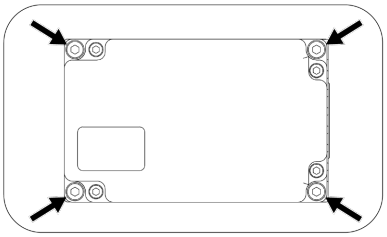
- The Q1m/Q1v is designed according to the 1000BASE-T communication standards.
  If other communication standards (100BASE-TX and such) are used, there may be a reduction in the refresh rate.
- Please use a cable other than a category 5e (CAT5e) cable as the Ethernet cable.
- The Q1m/Q1v is not compatible with DHCP (⏩🕮 3-3).

Replacing the Q1m/Q1v Power Battery

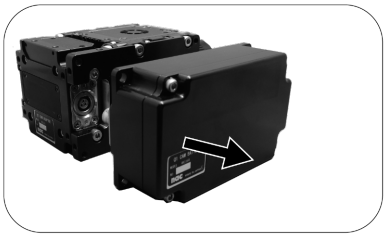
It explain mounting, a disassembly method of the Q1m/Q1v Power Battery.

Attention • Turn the battery switch OFF when replacing.



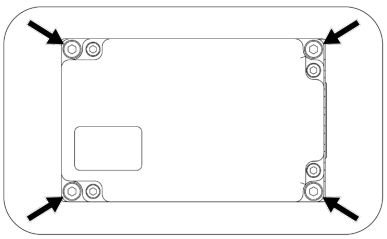


1 Remove the battery securing screws
- Do not lose the screws.



2 Remove the Q1m/Q1v power battery
- It fits together with the connector so slide out horizontally.

3 Mount the replacement Q1m/Q1v power battery
- Align with the indentations of the connector and slide straight in.



4 Secure the Q1m/Q1v power battery with the screws removed in #1

Attention • The LED for the display for the remaining battery resets when the battery is replaced. Charge to enable the display for the remaining battery.

Battery LED

The battery LED of the adapter unit displays a state of the battery.

■ Battery LED

The battery LED shows the status of the Q1m/Q1v power battery.

LED Status		Battery Status	Operation
Not lit		No battery	The Q1m/Q1v power battery is not installed. Or the battery switch is in the OFF mode.
Slowly (at about 5 second intervals) flashing red		Standby (Camera is OFF)	There is no external power source or the battery switch is ON but the camera has not started up. Do not leave in this state for long periods of time (1 or more days).
Flashing two times repeatedly.	The amount remaining is display according to the color. Alternating 3 colors: Unknown amount remaining (At a given amount of time after starting to discharge, or when a full charge has been detected, it will change to one of the following three colors) Green:Amount of charge: High Orange:Amount of charge: Medium Red:Amount of charge: Low	Charging	Charging is in progress. When the battery is fully charged, it will turn on continuously in green.
Continuously lit		Standby (camera is ON)	Charging is interrupted or completed. This is the state when the Q1m / Q1v is running after being fully charged (lit green) or with an external power supply.
Flashing (at 3 second intervals)		Charging	The camera is activated by supplying power from the battery.
Flashing quickly in red		Abnormal temperature	The battery temperature is abnormally high. Suspend the external power supply and camera operation.

Attention

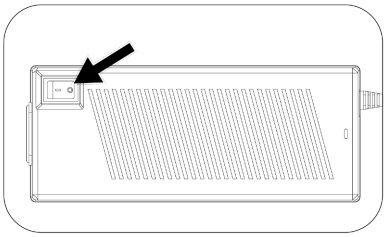
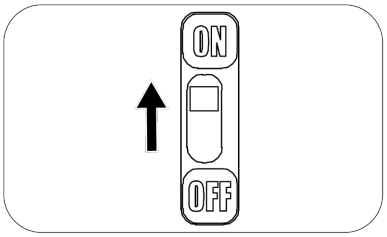
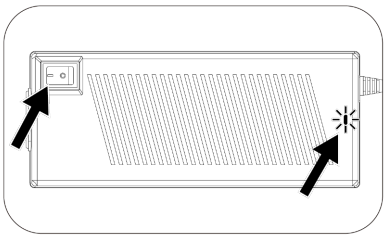
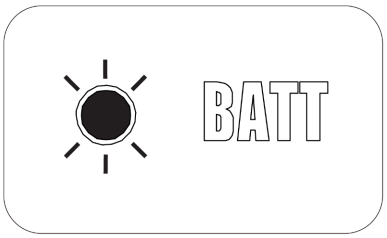
- If using the battery, make sure that charging has already been done and there is a full charge (the LED is lit in green). Also, make sure to turn the battery switch OFF when replacing.
- The amount remaining displayed while using is affected by the differences in individual batteries and by the ambient temperature and so is not correct, so use only as a guide.
- If the power battery is mounted to the Q1m/Q1v for a long period of time (1 day or more), turn the battery switch OFF. If the battery switch remains ON, the battery will be depleted due to the operation of the internal circuits.

Charging the Q1m/Q1v Power Battery

Charge Q1m/Q1v Power Battery.

Attention
- Install the Q1m/Q1v power battery for charging.
- The Q1m/Q1v power battery cannot be charged when the Q1m/Q1v is being operated.

Charging

	1	Turn the external power source for the AC adapter OFF
	2	Turn the battery switch ON
	3	Turn the external power source for the AC adapter ON • Charging starts.
	4	The battery LED will be lit in green when charging is done

CHECK
- It takes approximately 3.5 hours from a completed depleted state to a fully charged state.

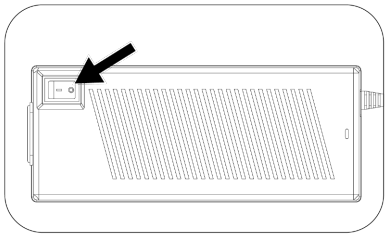
Attention
- If the POWER switch is pressed while charging, the Q1m/Q1v starts up and charging is suspended. If the POWER switch is pressed again, the power to the Q1m/Q1v is cut off and charging starts again.
- The remaining battery charge display during discharge should be used as a guide rather than an accurate display due to battery differences and environmental temperature effects.
- If the external power source is turned ON before the battery switch, the Q1m/Q1v starts up but charging does not occur. If the POWER switch is pressed after turning the battery switch ON, the power to the Q1m/Q1v is cut off and battery charging begins.

Turning ON/OFF the Q1m/Q1v Power

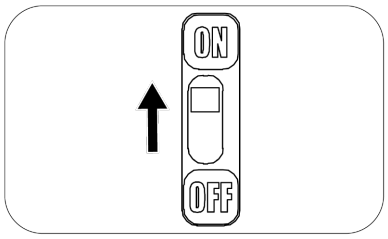
Q1m/Q1v where Power Battery is attached to is started.

■ If Using a Camera with Only the Q1m/Q1v Power Battery Without Using an External Power Source

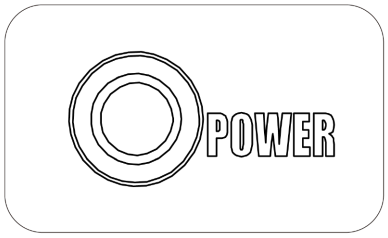
■ Turning ON the Power



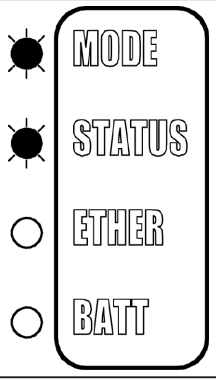
1 Turn the external power source for the AC adapter OFF



2 Press the POWER switch
- Power is supplied to the Q1m/Q1v.



3 Press the POWER switch
- Power is supplied to the Q1m/Q1v.



4 Check the status of the camera LED
- The startup triggers the self-diagnosis to begin.
- MODE: Lit blue
  STATUS: Lit green
  Upon reaching these states, the camera starts up normally.

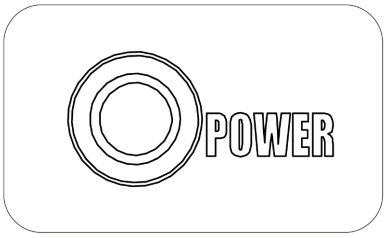
5 Use the control software to operate

Attention
- If the AC adapter and such are connected with an external power source, it automatically switches from the power battery to the external power source.

■ Turning OFF the Power

1 Disconnect the HX Link and camera with the Windows PC

- Make sure to save any recorded images needed before disconnecting.
- Disconnect the HX Link from the Q1m/Q1v.



2 Press the POWER switch

- The power to the Q1m/Q1v will automatically be cut.

Attention

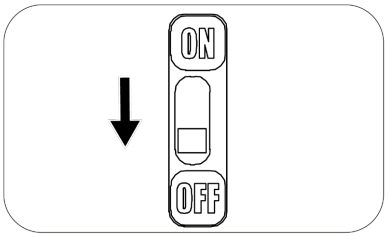
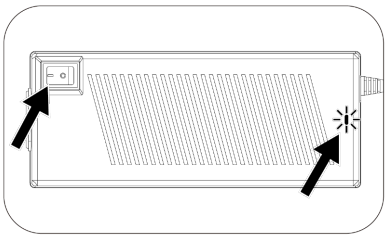
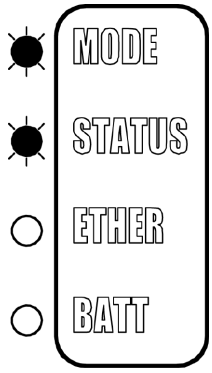
- If the power is cut when the memory backup battery is not charged, the recorded images will be deleted from the memory on the main unit, regardless of the charged state of the power battery.
- Before turning off the power, make sure to save any recorded images required. Refer to the "HXLink User's Guide" for how to save images.

CHECK

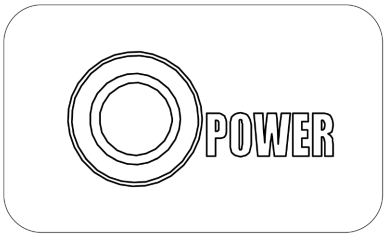
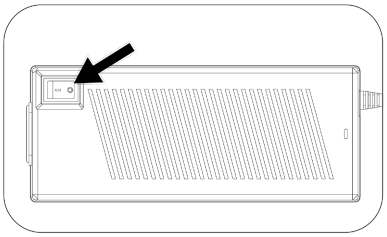
- Q1m / Q1v can be turned on / off with the POWER switch while the AC adapter is on.

■ If Using with an AC Adapter and External Power Source

■ Turning ON the Power

	1	Turn OFF the battery switch
	2	Turn the power switch on the AC adapter to ON • After confirming that the cable connects the AC adapter to the camera, turn the switch ON.
	3	Check the status of the camera LED • The startup triggers the self-diagnosis to begin. • MODE: Lit blue STATUS: Lit green Upon reaching these states, the camera starts up normally.
	4	Use the control software to operate

■Turning OFF the Power

	1	Disconnect the HX Link and camera with the Windows PC ● Make sure to save any recorded images needed before disconnecting. ● Disconnect the HX Link from the Q1m/Q1v.
	2	Press the POWER switch ● The power to the Q1m/Q1v will automatically be cut.
	3	Turn OFF the AC adapter power switch

ご注意 ● If the power is cut to the AC adapter when the memory backup battery is not charged, the recorded images will be deleted from the memory on the main unit
● Before turning off the power, make sure to save any recorded images required. Refer to the "HXLink User's Guide" for how to save images.

Specifications

■ Q1m/Q1v Power Battery

Battery	Battery used:	Nickel-hydrogen battery
	Model:	8 AA batteries
	Nominal capacity:	2.0Ah
	Life:	1 year (Since there is tremendous variation depending on the ambient temperature and use environment, the rule of thumb is to replace annually)
Operating Time	About 30 minutes (ARM state, no options (WLAN))	
Charging Time	About 3.5 hours (from completely depleted to fully charged)	
Power Consumed when Charging	About 12W	
External Dimensions (W×H×D)	About W40×H62×D101mm (excluding connectors and protruding parts)	
Weight	About 420g	
Operating Temperature and Humidity	0 to 40°C, 30 to 80%RH (no condensation)	
Storage Temperature and Humidity	-20 to 30°C, 20 to80%RH (no condensation)	
Vibration (Q1m/Q1v installed)	In compliance with MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE 514.2-2A	
Impact (Q1m/Q1v installed)	Half-sine, 10msec, 150G, 6 axis Total of 1,000 times	

Switch	(1)	Switch
	(2)	LAN connection switch Temperature and Humidity Used with the wireless LAN option (WLAN). Set to LAN when using a wired LAN.
External Dimensions (W×H×D)	About W62×H62×D36mm (excluding connectors and protruding parts)	
Weight	About 190g	
Operating Temperature and Humidity	0 to 40°C, 30 to 80%RH (no condensation)	
Storage Temperature and Humidity	-10 to 60°C, 20 to 80%RH (no condensation)	
Vibration (Q1m/Q1v installed)	In compliance with MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A	
Impact (Q1m/Q1v installed)	Half-sine, 10msec, 150G, 6 axis Total of 1,000 times	

■ Mounting Plate

External Dimensions (W×H×D)	About W7×H62×D101mm
Weight	About 52g

Attention

- Any installation of the adapter unit or mounting plate should be performed by us. Please do not remove.

■ Control with IF Connector PWRCTL Signals

Input PWRCTL signal to the Q-Cam cable makes it possible to control the power in the same manner as the POWER switch on the adapter unit.

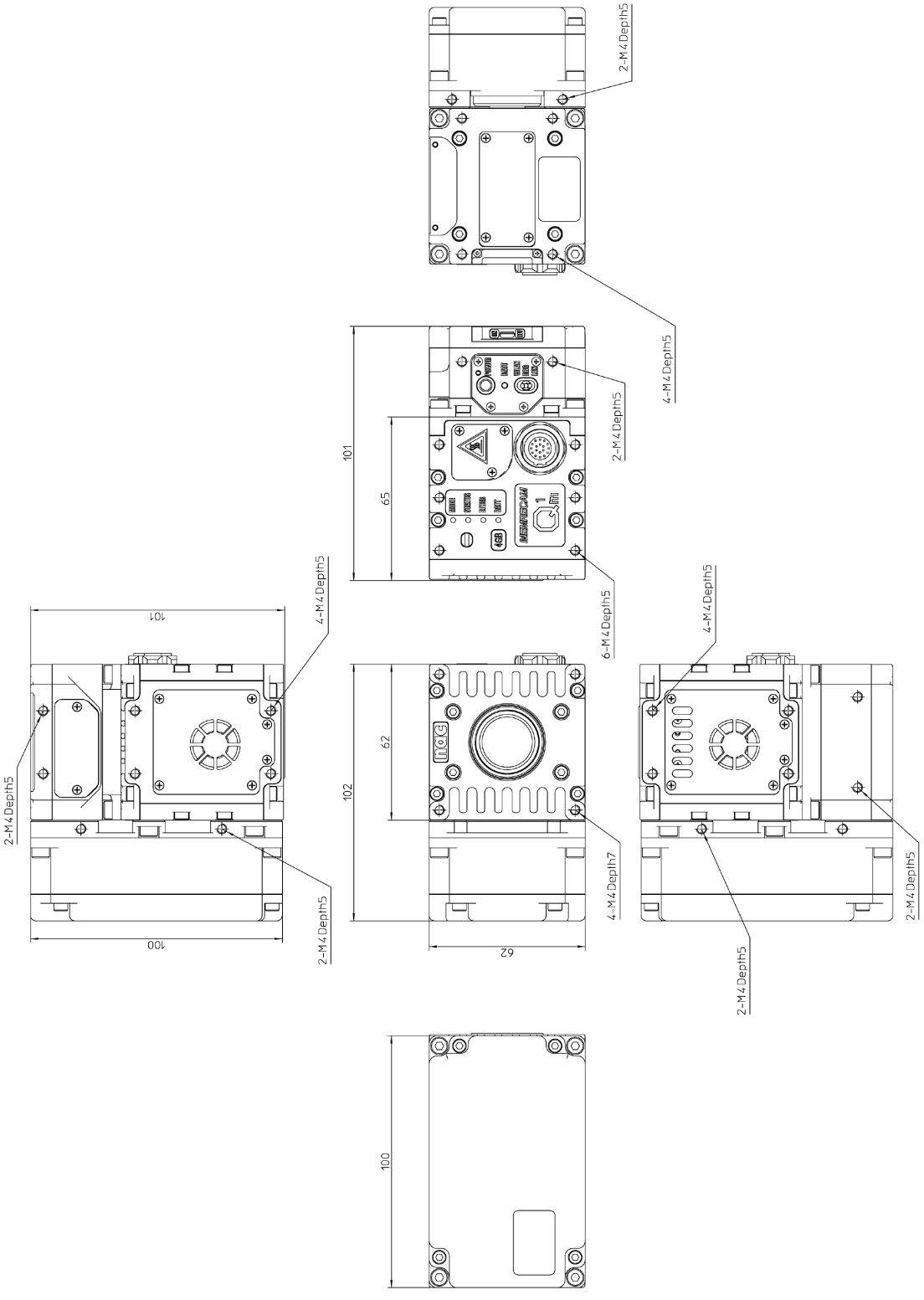
PWRCTL Signal	Q1m/Q1v Status	Operation
OFF	OFF (POWER switch disabled)	The Q1m/Q1v does not start up.
OFF -> ON	OFF -> ON	If signals change from OFF to ON, the Q1m/Q1v starts up.
ON	POWER switch enabled	If the PWRCTL signal is ON, the POWER switch on the adapter unit can be used.
ON -> OFF	ON -> OFF	The Q1m/Q1v power is turned OFF.

OFF: PWRCTL L level input, or a short circuit state
ON : PWRCTL H level or, an open state

PWRCTL Signals

PWRCTL	Signal Level	CMOS level, 5V pull up, isolated L level: -0.5VDC (minimum applied voltage) to 1.2VDC H level: 3.6VDC to 5.5VDC (maximum applied voltage)
	Function	H: Power ON L: Power OFF No polarity inversion function

Dimensional Drawings



6

Q-HUB

(00374)G

Q-HUB Features

High speed photography is possible in a variety of environments simply by combining the MEMRECAM Q1m/Q1 and the Q-HUB.

Recording with up to 4 Q1m/Q1v cameras is possible with 1 Q-HUB

A maximum of four MEMRECAM Q1m/Q1v can be connected with one Q-HUB. The cameras can be powered and controlled.

Cascade connections are possible

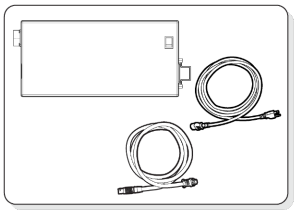
Q-HUBs can be connected each other up to 3x Q-HUBs depending on IT environment (⏭🕮 6-17).

A multiple camera system can be built with your current camera

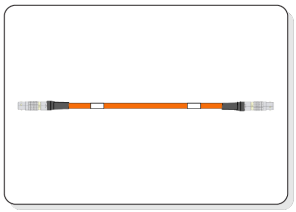
A multiple camera system configuration is possible by using the MEMRECAM GX series, the HX series and the GX-HUB.

Main Options

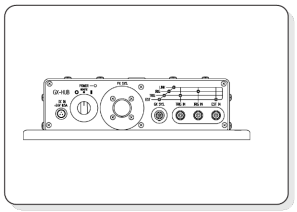
The following are the main Q-HUB options.



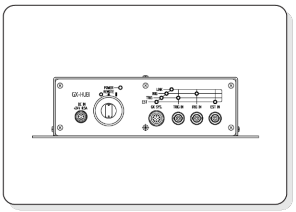
● AC POWER SYSTEM



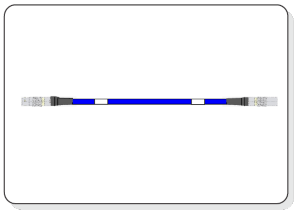
● Q-Cam Remote Cable



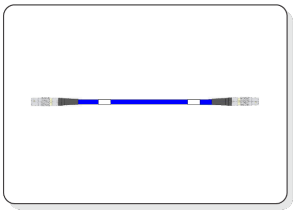
● GX-HUB



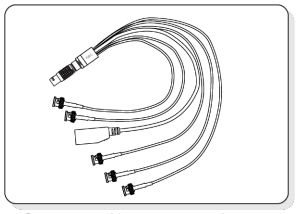
● GX-HUBi



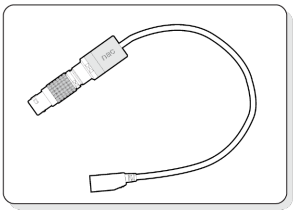
● GX Remote Cable



● GX Remote Cable
(for the GX-HUBi)



● J3 Splitter Cable



● Simple J3 Cable

- AC POWER SYSTEM — AC power system for the Q-HUB. AC cable and DC cable set.
- Q-Cam remote cable — Connection cable between the Q1m/Q1v and the Q-HUB.
- GX-HUB — MEMRECAM GX, HX series multi-camera option (with environmental resistance)
- GX-HUBi — MEMRECAM GX, HX series multi-camera option (no environmental resistance)
- GX remote cable — Cable for conncting the Q-HUB and the GX-HUB
- GX remote cable (for the GX-HUBi) — Cable for connecting the Q-HUB and the GX-HUBi, the Q-HUB and the MEMRECAM GX, HX cameras
- J3 splitter cable — Input/output cable for both the HX and GX series
- Simple J3 cable — The two types of BNC connectors include the plug type and the receptacle type.
- Cable for connecting the PC for joint control of the HX and GX series

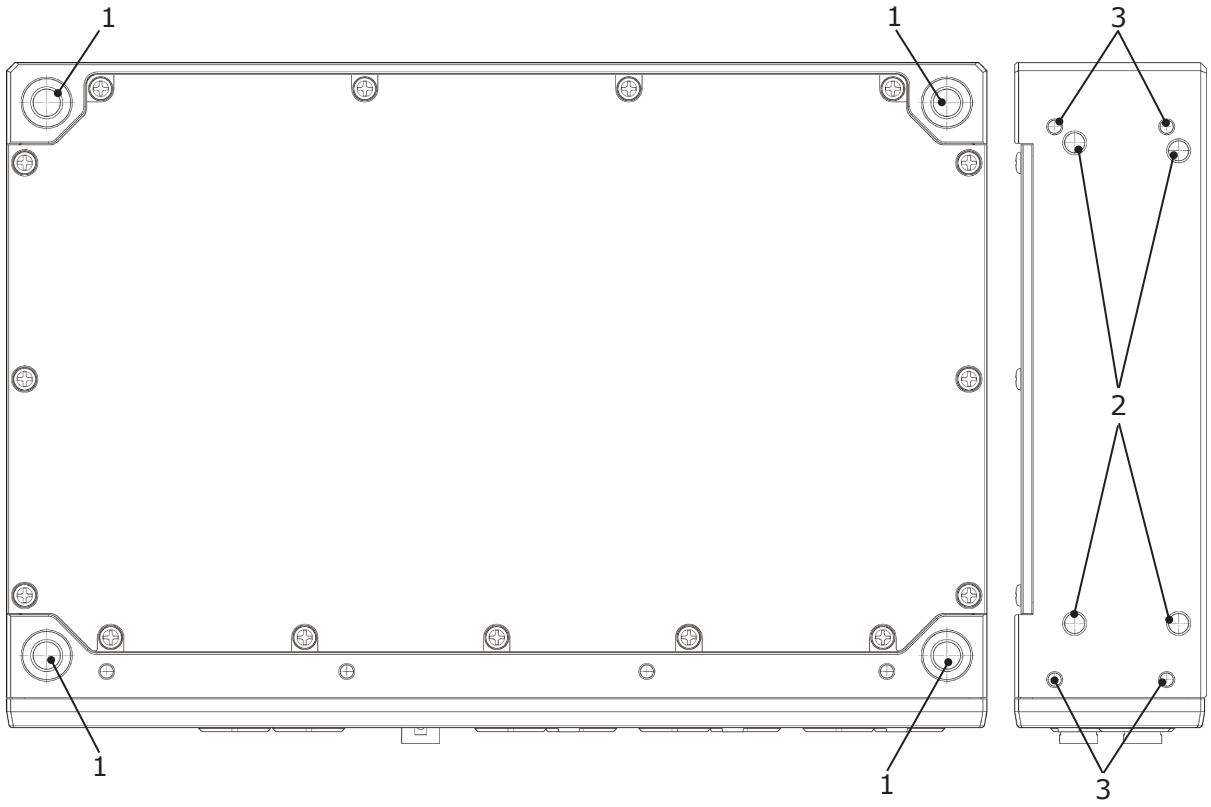
Attention

- Please do not use in environments where the AC power system can be bumped or vibrated.
- Do not use the Q-Cam remote cable with the MEMRECAM HX or GX series.
- The separate MINI AC POWER SYSTEM is required to use the GX-HUB/GX-HUBi.
- Please do not use in environments where the GX-HUBi can be bumped or vibrated. Use the GX-HUB in those types of environments.
- Refer to (⏭🕮 7-2)for details Q-HUB BATTERY PACK.

External Appearance and Names for this Unit

■ External Appearance and Names for this Unit

Top, Right Side



1 Screw holes (4 locations M8 depth 11.5 mm)

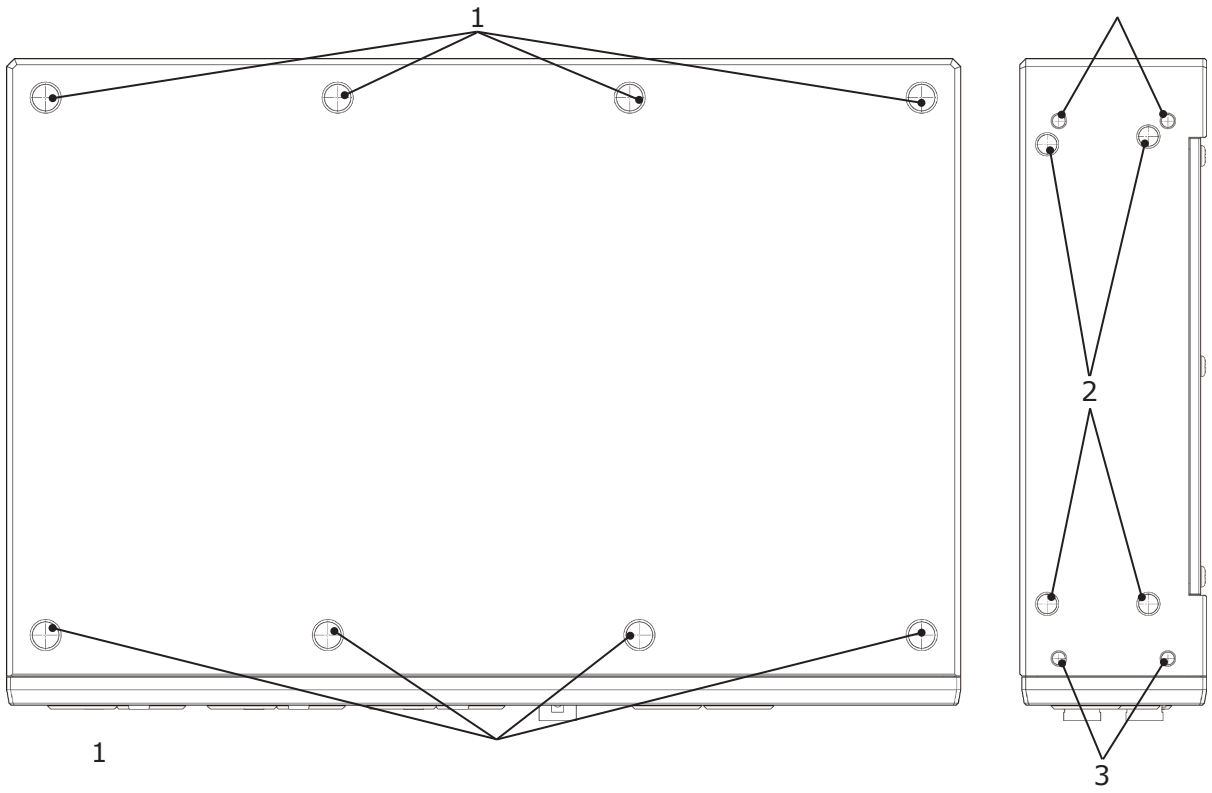
2 Screw holes (4 locations M6 depth 8.5 mm)

3 Screw holes (4 locations M4 depth 6 mm)

Attention

- Do not use screws longer than the depth of the screw holes as this may cause a malfunction.

Left Side, Bottom



1 Screw holes (8 locations M8 depth 11 mm)

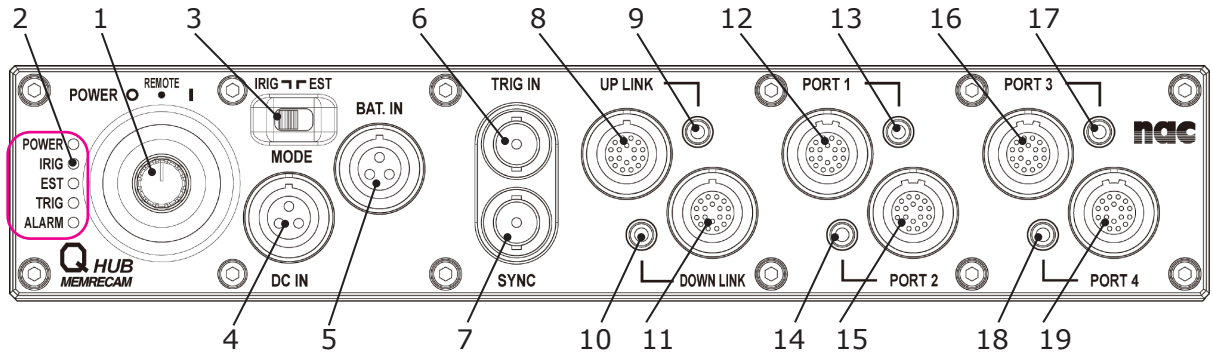
2 Screw holes (4 locations M6 depth 8.5 mm)

3 Screw holes (4 locations M4 depth 6 mm)

Attention

- Do not use screws longer than the depth of the screw holes as this may cause a malfunction.

Front, Back


2
1
3
6
8
9
12
13
16
17
POWER
REMOTE
IRIG
EST
MODE
BAT. IN
TRIG IN
UP LINK
PORT 1
PORT 3
POWER
IRIG
EST
TRIG
ALARM
Q HUB
MEMRECAM
DC IN
SYNC
DOWN LINK
PORT 2
PORT 4
nac
4
5
7
10
11
14
15
18
19


MEMRECAM
Q-HUB
MODEL V-847
NO.
nac MADE IN JAPAN
21
20
22
20
21

1	Power switch	12	PORT 1 connector
2	Status LED	13	PORT 1 LED
3	Synchronization signal switch (Factory default IRIG)	14	PORT 2 connector
4	DC IN connector	15	PORT 2 LED
5	BAT. IN connector	16	PORT 3 connector
6	TRIG IN connector	17	PORT 3 LED
7	SYNC connector	18	PORT 4 connector
8	UP LINK connector	19	PORT 4 LED
9	UP LINK LED	20	Screw holes (4 locations M6 depth 8.5 mm)
10	DOWN LINK connector	21	Screw holes (4 locations M4 depth 6 mm)
11	DOWN LINK LED	22	Product nameplate (where the product number is written)

Attention

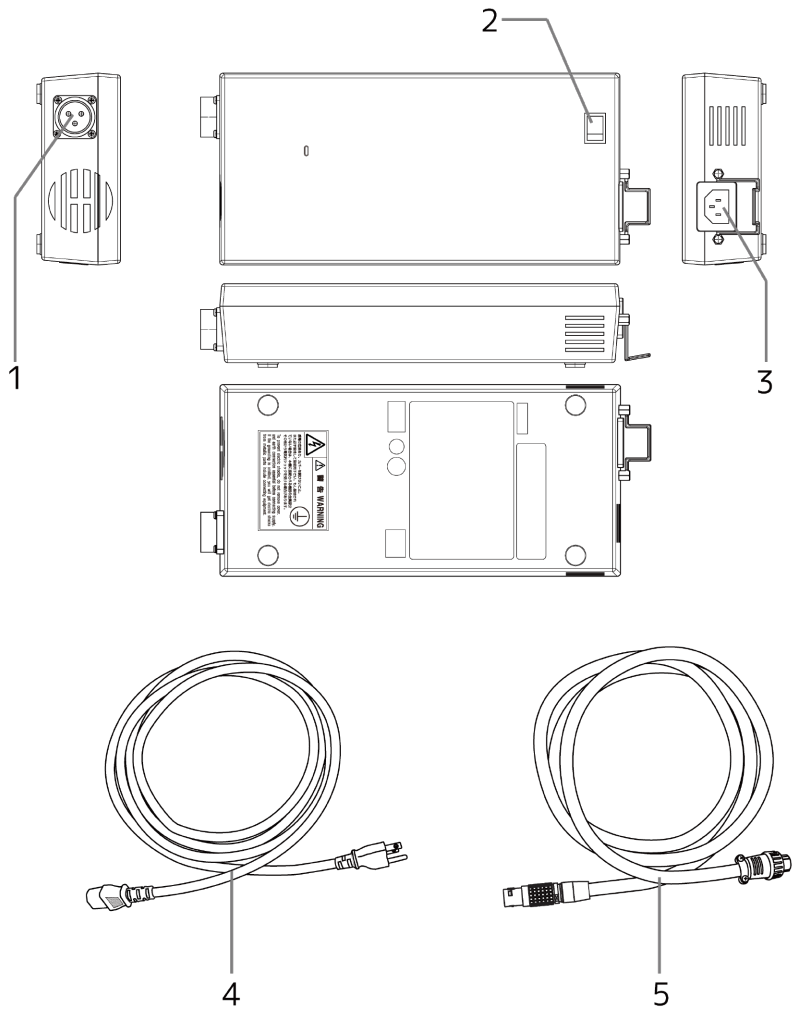
- Do not use screws longer than the depth of the screw holes as this may cause a malfunction.

Status LED

The five status LEDs indicate the status of the Q-HUB.

LED	LED Status	Operation	⏩🕮
POWER	Lit in green	Power ON	6-15
	Not lit	Power OFF	6-16
IRIG	Lit in green	IRIG signal or 1kHz input and locked. (Synchronization signal switch is IRIG)	
	Lit in red	No IRIG signal or 1kHz input or not locked even if input. (Synchronization signal switch is IRIG)	
	Not lit	Synchronization signal switch set to EST	
EST	Lit in green	Synchronization signal switch set to EST	
	Not lit	Synchronization signal switch set to IRIG	
TRIG	Lit in green	For one second after trigger signal is input (then is not lit)	
		Or if there is trigger signal input when connected within 1 second	
	Not lit	No trigger signal	
ALARM	Lit in red	Notification of an overcurrent or overvoltage, or low voltage in the power line	
	Not lit	Normal	

External Appearance and Names for the AC Power System



1 DC connector
2 Power switch
3 AC connector
4 AC cable
5 DC cable

Connect the Equipment and Cables

This describes the connections for the Q-HUB peripherals and cables.

■ Input/Output Connector

Connector Name	Splitter Connector Name	Input/Output Signal
PORT 1 to 4	—	For Q1m/Q1v camera and Q5 connection (*1)
UP LINK	—	Q-HUB, GX-HUBi connection (*2) GX-HUB connection (*3) Windows PC connection for control (*4,5)
	ETHER (*4 or 5)	1000BASE-T Ethernet
	TRIG2 (*5)	External trigger input (TRIG2)
	EST2 (*5)	IRIG-B (DCLS) , SYNC 1kHz, Recording start signal input (EST2)
	IRIG-B (*5)	IRIG-B (AM), Time code input
	EPO (*5)	Exposure pulse output (EPO)
	PWRCNT (*5)	Power control signal input
DOWN LINK	—	For Q-HUB, MEMRECAM GX camera, HX camera connection (*2)
TRIG IN	—	External trigger input (TRIG1)
SYNC	—	IRIG-B (DCLS) , SYNC 1kHz, Recording start signal input (EST1)
DC IN	—	Power input
BAT. IN	—	For external battery connection

*1 Requires a Q-Cam remote cable (option).

*2 Requires a GX remote cable (for GX-HUBi, option).

*3 Requires a GX remote cable (option).

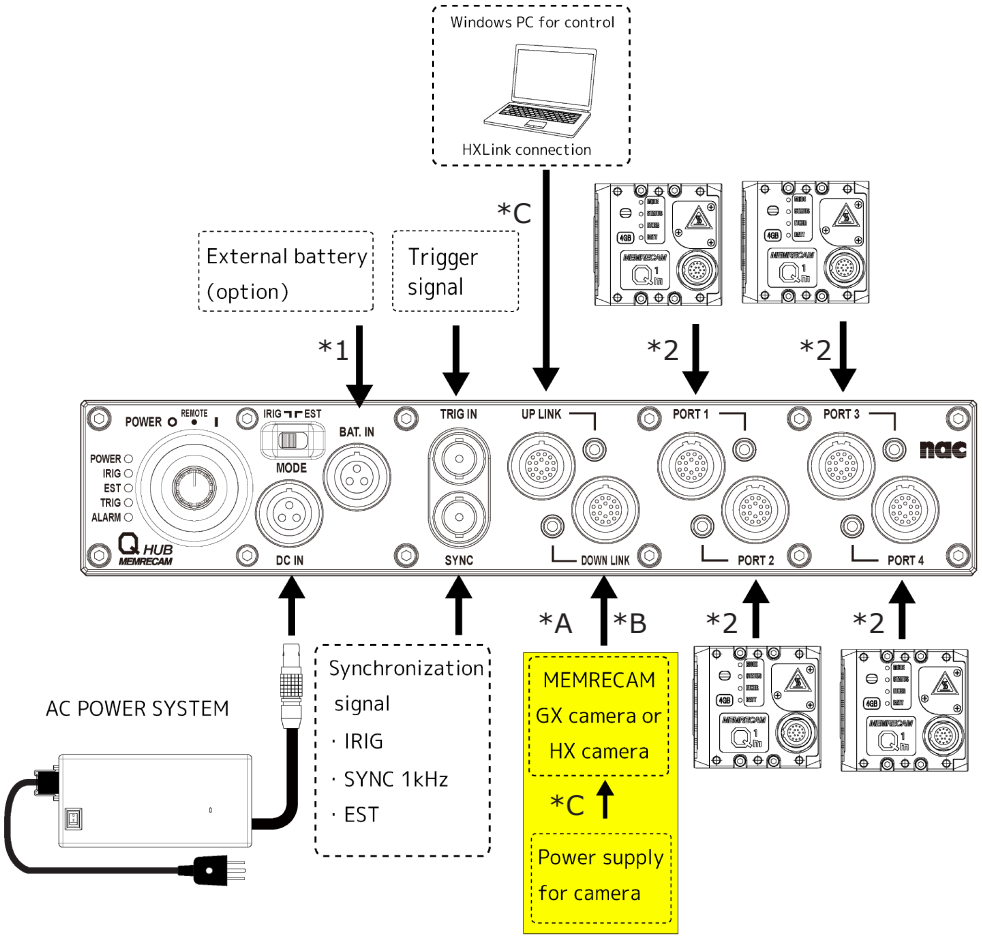
*4 Requires a simple J3 cable (option).

*5 Requires a J3 splitter cable (option).

Attention

- The GX-HUB and the GX-HUBi cannot be connected to the DOWN LINK connector.

Diagram of Connections (Q-HUB in one)



*1 Set synch signal as IRIG when IRIG is in use. Please set it as EST when other signals are in use.

*2 Requires a Q-Cam remote cable (option). The power supply of the camera is supplied from Q-HUB.

*3 Requires a J3 splitter cable or a simple J3 cable (option).

● GX/HX camera connected into DOWNLINK

*A Requires a GX remote cable (for GX-HUBi, option).

*B Either one GX or HX camera can be connected into DOWNLINK (not GX-HUB/GX-HUBi).

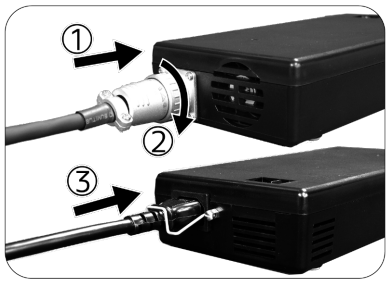
*C To synch exposure of GX/HX cameras with Q1 cameras, IRIG-B (AM) has to be input into UPLINK (with J3 cable). Or, please perform synchronization in the EST.

When connecting multiple Q-HUBs (🕮 6-17).

■ Connect the Power

1 Turn the power switch OFF.(▸▸🕮 6-9)

- Turn the power switch on the AC power system OFF.



2 Connect the cable to the AC power system

- Align the DC cable plug with the DC OUT connector and plug straight in. (1) Turn the casing of the cable plug in the direction of the arrow (2) to lock the cable.
- Plug the AC cable straight into the AC IN connector. (3)

3 Plug in the AC cable.

4 Connect the DC cable to the Q-HUB

- Match the Q-HUB DC IN connector with the red mark on the DC cable plug and plug straight in until a "click" is heard.
- When removing the DC cable from the Q-HUB, grasp the casing of the plug and pull straight out.

Attention

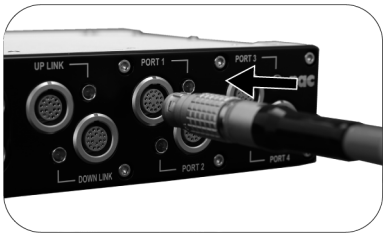
- When unplugging the DC cable and the AC cable, make sure to turn the power to the Q-HUB main unit and the AC power system OFF. Before turning the AC power system switch OFF, turn the power to the Q-HUB main unit OFF.
- Do not open the cover of the AC power system. There are places that generate high voltage and so it is dangerous.
- Make sure to ground the unit. There is a possibility of receiving an electrical shock if not grounded.
- If plugging in by using a 3P-2P converter plug, connect the grounding wire of the converter plug to the external grounding wire.
- The AC power system is designed specifically for the Q-HUB so do not use on other devices.
- Refer to (▸▸🕮 7-2) for details Q-HUB BATTERY PACK.

■ Connect the Q1m/Q1v

Use the Q-Cam remote cable sold separately and connect the Q1m/Q1V.

1 Connect the Q-Cam remote cable to the camera

- Match the camera IF connector with the red mark on the Q-Cam remote cable and plug straight in until a "click" is heard.



2 Connect the Q-Cam remote cable to the Q-HUB

- Match the Q-HUB PORT 1 to 4 connector with the red mark on the Q-Cam cable plug and plug straight in until a "click" is heard.

CHECK

- The Q1m/Q1v can also be connected to any of the ports of PORT 1 to 4.

Attention

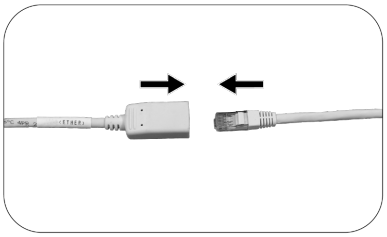
- When unplugging the cable, make sure to turn the power to the Q-HUB.
- The Q-Cam remote cable is designed specifically for the Q1m/Q1v and the Q5. It cannot be used with the MEMRECAM GX or HX series.

■ Connect the Windows PC for Control

Use the Ethernet to connect to a PC.

☐ Connect the simple J3 cable to the UP LINK connector

- Connect the simple J3 cable or the J3 splitter cable (sold separately) to the REMOTE connector.



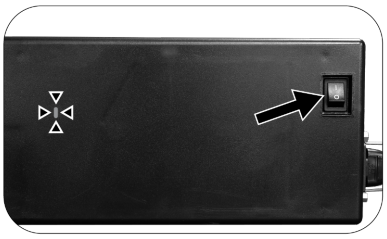
2 Connect the Ethernet cable to the simple J3 cable Ethernet connector. Connect to the Windows PC.

- Connect the Ethernet cable to the Ethernet connector (RJ45) of the simple J3 cable. Connect the other Ethernet cable to the Windows PC.

Turn the Power ON/OFF

Turn the power ON to start the Q-HUB.

■ Start the Q-HUB



1 Turn the power switch for the AC power system ON.

- Verify that the AC and DC cables are connected to the AC power system and Q-HUB (⏭🕮 5-11) and then turn the switch ON.
- The LED for the AC power system power switch will light up.

2 Turn the power switch for the Q-HUB in the direction of the arrow to turn ON.

- Click past REMOTE and turn until ON.
- The power on the status LED for the Q-HUB will light up.
- The Q1m/Q1v camera connected to PORT 1 to 4 will also start up.

3 Switch to synchronization signals

- IRIG: Set to IRIG B (DCLS, AM) or to SNYC 1kHz.
- EST: Set to EST.

Set to IRIG if not using synchronization signals or EST.

Attention

- Do not switch the synchronization signal switch when Q1m/Q1v is in the ARM state.

■Turn OFF the Q-HUB Power

1 Disconnect the HX Link and each camera with the Windows PC

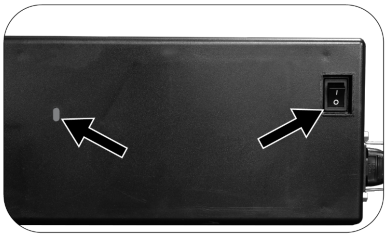
- Save the recorded images required before disconnecting.
- Disconnect the HX Link and each of the cameras.

2 Turn the Q-HUB power switch in the direction of the arrow to turn OFF.

- Click past REMOTE and turn until OFF.
- The power on the status LED will go off.
- Power is cut off to the Q1m/Q1v camera

CHECK

- The Q1m/Q1v connected to PORT 1~4 can be plugged in and unplugged.
- A power supply for memory backup of Q1m/Q1v as for the state of REMOTE power switch of Q-HUB is supplied from Q-HUB.



3 Turn the AC power system power switch OFF after making sure the power status LED is out.

Attention

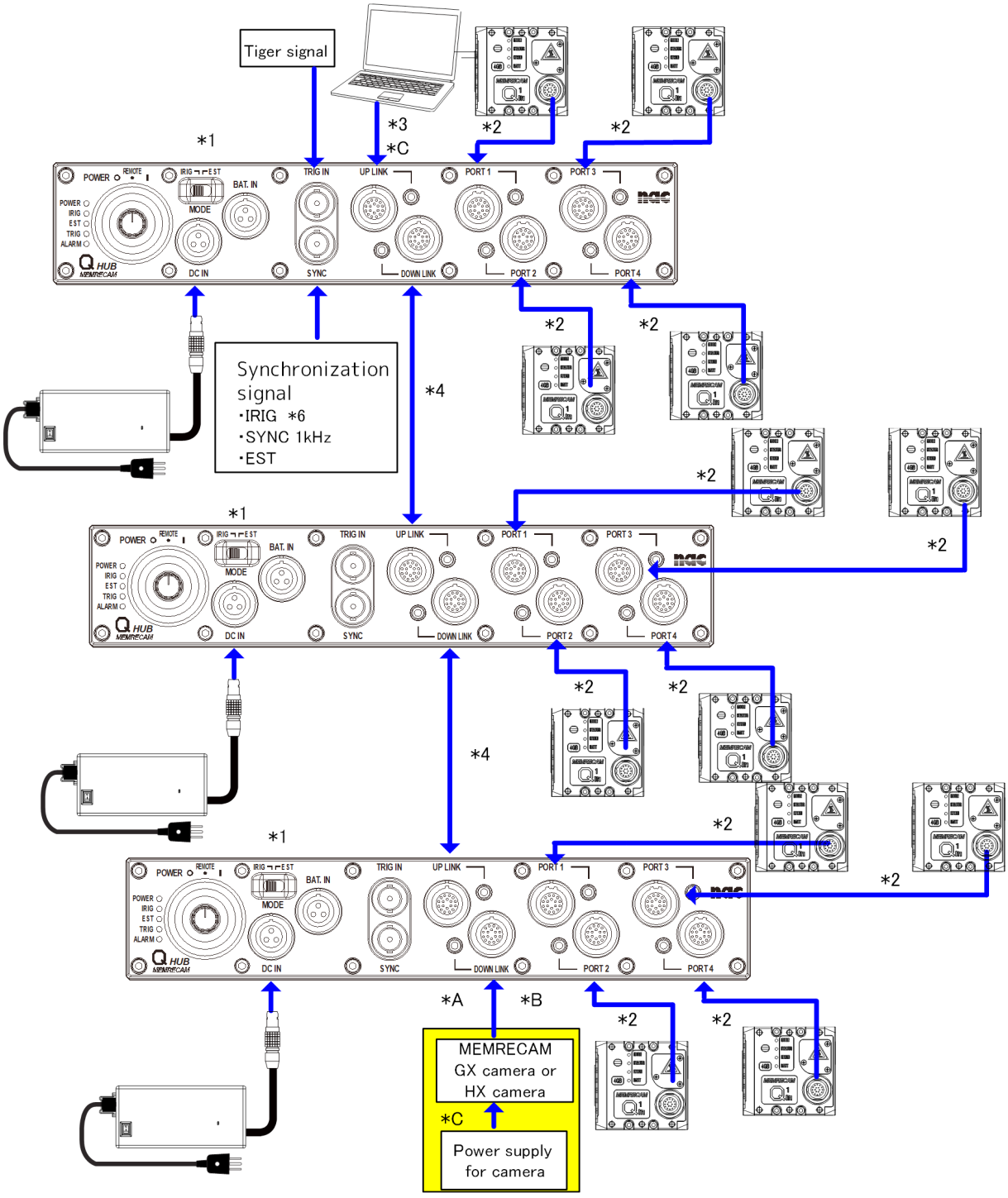
- If the power switch for the AC power system is turned OFF when the Q1m/Q1v memory backup battery is not charged, the recorded images are deleted from the camera.
- Save the recorded images required to the control PC before disconnecting. See the "HX Link User's Guide" for instructions on how to save.
- Q-HUB uses the power that a power supply is small amount in the state of OFF.

  The cases not to use, please exclude connection of the external battery for a long time.

Connect Multiple hubs

When connecting multiple Q-HUBs or connect with GX-HUB

■ When using 3 pcs of Q-HUB

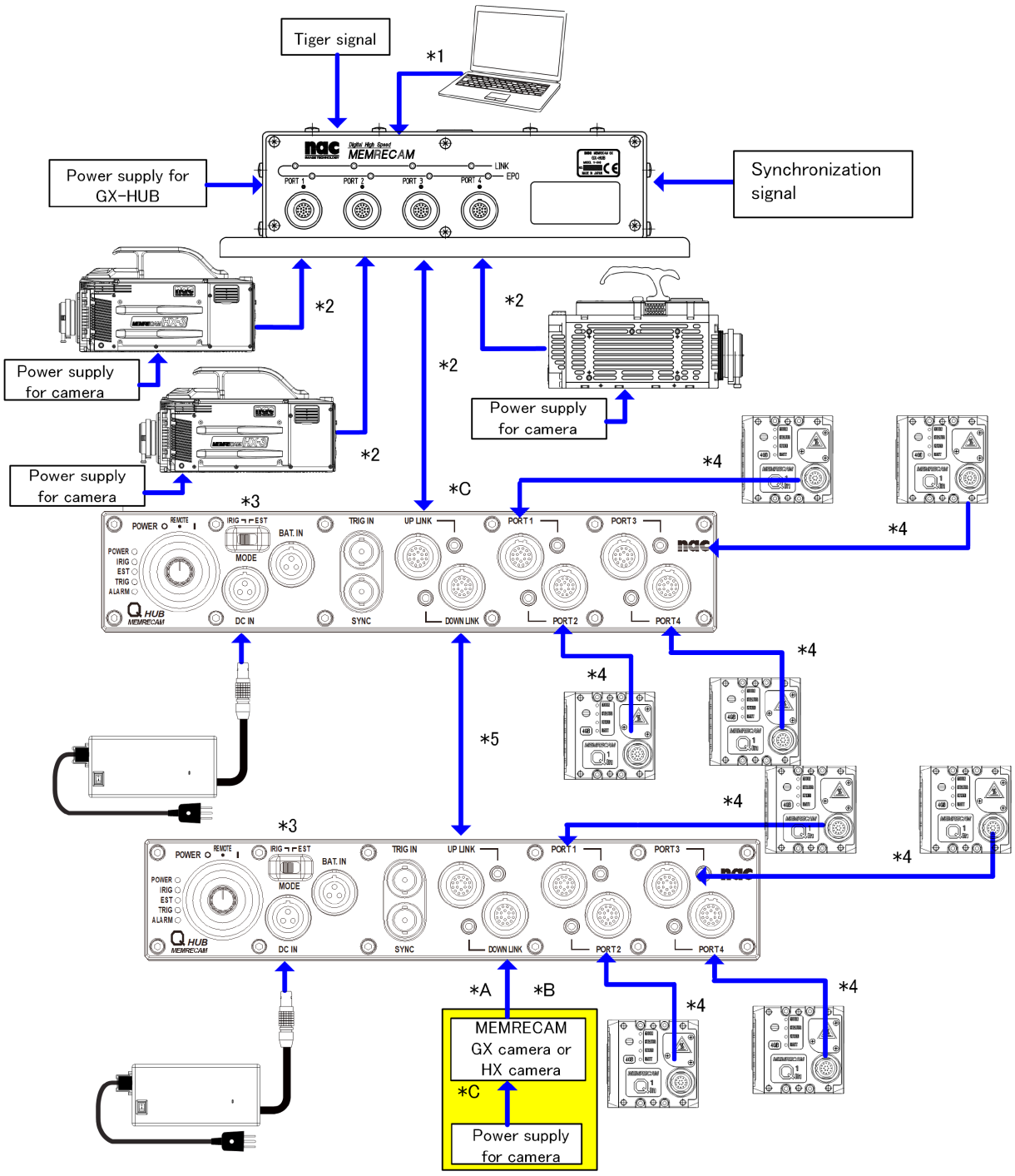


*1 Set synch signal as IRIG when IRIG is in use. Please set it as EST when other signals are in use.
*2 Connect with Q-Cam Remote Cable. Power supplied from Q-HUB
*3 Connect with full or simplified J3 Cable
*4 Connect with GX Remote Cable (for GX-HUBi)

● GX/HX camera connected into DOWNLINK
*A Connect with GX Remote Cable (for GX-HUBi)
*B Either one GX or HX camera can be connected into DOWNLINK (not GX-HUB/GX-HUBi)
*C To synch Q1m/Q1v cameras with GX/HX camera connected into DOWNLINK, it requires a J3 Full-wired cable (Option) connected into UPLINK and with IRIG (AM) signal provided.

Attention
- Q-HUBs can be connected each other up to 3x Q-HUBs depending on IT environment (PC performance, network environment etc.)
- It is necessary to be connected to each Q-HUB when uses external battery.

■When using GX-HUB and 2 pcs of Q-HUB



*1 Connect with full or simplified J3 Cable
*2 Connect with GX Remote Cable (for GX-HUB)
*3 Set synch signal as IRIG when IRIG is in use. Please set it as EST when other signals are in use.
*4 Connect with Q-Cam Remote Cable. Power supplied from Q-HUB
*5 Connect with GX Remote Cable (for GX-HUBi)

● GX/HX camera connected into DOWNLINK
*A Connect with GX Remote Cable (for GX-HUBi)
*B Either one GX or HX camera can be connected into DOWNLINK (not GX-HUB/GX-HUBi)
*C Connect GX-Hub into UPLINK (of 1st Q-Hub) when synch recording with GX/HX camera connected into DOWNLINK

Attention

- HUBs can be connected each other up to 3x HUBs depending on IT environment (PC performance, network environment etc.)
- It is necessary to be connected to each Q-HUB when uses external battery.

Specifications

■ Power Switch

Power Switch	Rotary SW (3positions) o (OFF) : Power OFF REMOTE: ON/OFF with power control signals A power supply for memory backup is supplied to Q1m/Q1v. l (ON) : Power ON

■ Synchronization Signal Switch

MODE Switch	Slide SW (2 position) IRIG:Sets the synchronization signals to IRIG B (DCLS, AM) or SYNC 1kHz (Factory default) EST: Sets the synchronization signals to EST

■ Status LED

POWER	Lit in green:	Power ON
	Not lit:	Power OFF
IRIG	Lit in green:	Locks in the IRIG B (DCLS, AM) signals or the 1kHz input (Synchronization switch is IRIG)
	Lit in red:	No IRIG B (DCLS, AM) signals or 1kHz input and does not lock in the phase. (Synchronization switch is IRIG)
	Not lit:	Synchronization signal switch set to EST
EST	Lit in green:	Synchronization signal switch set to EST
	Not lit:	Synchronization signal switch set to IRIG
TRIG	Lit in green:	Trigger signal input is lit for 1 second (Then goes out) or stays lit with continuous trigger input within 1 second
	Not lit:	No trigger signal
ALARM	Lit in red:	If an overcurrent or overvoltage, or low voltage is detected in the power line
	Not lit:	Normal

■ UPLINK/DOWNLINK/PORT 1 to 4 LED

	Lit in green:	Ethernet link established
	Not lit:	Not connected or link not established

■ DC IN connector

Application	Power input	
Model	LEMO EGG.2B.303	
Compatible plug	LEMO FGG.2B.303	
Power voltage	DC20 - 32V	
Energy consumption	Energy consumption	
Power protection	Reverse polarity:	Internal protection circuit
	Overcurrent:	Internal protection circuit About 12A
	Overvoltage:	35VDC 1 minute
	Low voltage:	About 19VDC

Pin No.	Name	Direction	Function • Input/output Level	Notes
1	DC24V IN	IN	DC + input	DC20 - 32V
2	FRAME GND	—	Frame ground	
3	DC24V RTN	IN	DC + return	
shell	FRAME GND	—	Frame ground	

■ BAT IN connector

Application	Power input	
Model	LEMO EGG.2B.303	
Compatible plug	LEMO FGG.2B.303	
Power voltage	DC22.5 - 32V Battery overdischarge: 20VDC Suppresses battery depletion by supplying power to the DC IN at 24V or greater.	
Energy consumption	Maximum of about 140W (Depending on the external battery sold separately)	
Power protection	Reverse polarity:	Internal protection circuit
	Overcurrent:	Internal protection circuit About 12A
	Overvoltage:	35VDC 1 minute
	Low voltage:	20VDC

Pin No.	Name	Direction	Function • Input/output Level	Notes
1	BAT24V IN	IN	DC + input	DC22.5 - 32V
2	BAT_TMP	—	Thermistor	
3	BAT24V RTN	IN	DC + return	
shell	FRAME GND	—	Frame ground	

■ TRIG connector

Application	TRIG1 trigger signal input
Model	BNC receptacle
Compatible plug	BNC plug
TRIG1 input	Signal level: TTL level, 5V pull-up resistance 4.7KΩ, Isolation input L level: -0.5VDC (minimum applied voltage) to 0.8VDC H level: 2.0VDC to 5.5VDC (maximum applied voltage) Function: Trigger value from H -> L, contact input possible

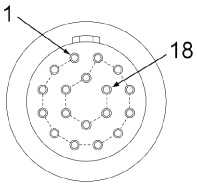
Pin No.	Name	Direction	Function • Input/output Level	Notes
1	TRIG1 IN	IN	TTL, contact point	Isolation
shell	TRIG1 IN RTN	IN	TRIG1 input signal return	Isolated ground

■ SYNC connector

Application	Synchronized signal input
Model	BNC receptacle
Compatible plug	BNC plug
Input	Signal level: TTL level, 5V pull-up resistance 4.7KΩ, Isolation input L level: -0.5VDC (minimum applied voltage) to 0.8VDC H level: 2.0VDC to 5.5VDC (maximum applied voltage) • IRIG B DCLS input • SYNC 1kHz input • EST input Function: Falling (H -> L) Start exposure Rising (L -> H) End exposure

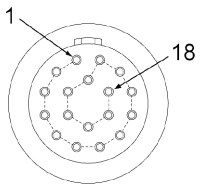
Pin No.	Name	Direction	Function • Input/output Level	Notes
1	SYNC1 IN	IN	TTL	Isolation
shell	SYNC1 IN RTN	IN	SYNC1 input signal return	Isolated ground

■ UP LINK connector

Application	Split input/output with Q-HUB, GX-HUB, or J3 cable	
Model	LEMO EGG.2B.318	
Compatible plug	LEMO FGG 2B.318	
ETHER	1000BASE-T (IEEE802.3ab), isolation	
SYNC2 IN	Signal level:	TTL level, 5V pull-up resistance 4.7KΩ, isolation input L level: -0.5VDC (minimum applied voltage) to 0.8VDC H level: 2.0VDC to 5.5VDC (maximum applied voltage)
	Function:	Set to EST mode, H ->L to start exposure when in the ARM or REC mode and film a single image Signal level saved with the image during EVENT input
IRIG-B IN	Signal level:	Isolation, IRIG B124 (AM), 1.1kΩ, 1Vp-p to 10Vp-p
TRIG2 IN	Signal level:	Isolation, trigger enabled with the photo coupler current loop, ±32V maximum applied voltage, 1.5KΩ current controlling resistance, 5V or more
EPO	Signal level:	5V CMOS output, Isolation
	Function:	Outputs the logical product of the EPO input for DOWN LINK, PORT1 to 4
PWRCNT IN	Signal level:	TTL level, 5V pull-up resistance 4.7KΩ, Isolation input L level: -0.5VDC (minimum applied voltage) to 0.8VDC H level: 2.0VDC to 5.5VDC (maximum applied voltage)
	Function:	Set the power switch to REMOTE, power OFF with L level or a short, power ON with H level or OPEN
Pin Configuration	 From the connector mating side	

Pin No.	Name	Direction	Function • Input/output Level	Notes
1	MDI 0+	I/O	1000BASE-T Interface	
2	MDI 0-	I/O	1000BASE-T Interface	
3	MDI 1+	I/O	1000BASE-T Interface	
4	MDI 1-	I/O	1000BASE-T Interface	
5	MDI 2+	I/O	1000BASE-T Interface	
6	MDI 2-	I/O	1000BASE-T Interface	
7	MDI 3+	I/O	1000BASE-T Interface	
8	MDI 3-	I/O	1000BASE-T Interface	
9	SYNC2 IN	IN	TTL	Isolation
10	SYNC2 IN RTN	IN	SYNC2 input signal return	Isolated ground
11	IRIG-B IN	IN	IRIG-B (AM), 1Vp-p to 10Vp-p	Isolation transformer
12	IRIG-B IN RTN	IN	IRIG input signal return	Isolation transformer
13	TRIG2 IN A	IN	Current loop, anode	Isolation
14	TRIG2 IN C	IN	TRIG2 input signal return	Isolation
15	EPO	OUT	CMOS level, 5V	Isolation
16	EPO RTN	OUT	EPO output signal return	Isolated ground
17	PWRCNT IN	IN	TTL or contact	Isolation
18	PWRCNT IN RTN	IN	PWRCNT input signal return	Isolated ground
shell	FRAME GND	—	Frame ground	

■ DOWN LINK connector

Application	Split input/output with MEMRECAM GX, HX camera connection, or J3 cable	
Model	LEMO EGG.2B.318	
Compatible plug	LEMO FGG 2B.318	
ETHER	1000BASE-T (IEEE802.3ab), isolation	
SYNC OUT	Signal level:	5V CMOS level, isolation ● IRIG B DCLS output ● EST output
	Feature:	Set to EST mode, H ->L to start exposure when in the ARM or REC mode and film a single image Signal level saved with the image during EVENT input
IRIG-B OUT	Signal level:	Isolation, IRIG B124 (AM) , 600Ω, 1Vp-p to 10Vp-p
TRIG OUT	Signal level:	5V output, isolation
	Function:	Trigger is effective in current 2.4mA or more Trigger is invalid in current 0.1mA or less
EPO IN	Signal level:	TTL level, 5V pull-up, isolation L level: -0.5VDC (minimum applied voltage) to 0.8VDC H level: 2.0VDC to 5.5VDC (maximum applied voltage)
	Function:	Falling (H -> L): Start exposure Rising (L -> H): End exposure
PWRCNT OUT	Signal level:	Switch circuit, isolation
	Function:	Open (Maximum allowable voltage 5.5V): Power ON Short: Power OFF
Pin Configuration		

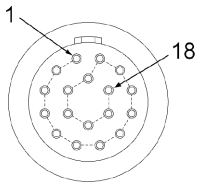
From the connector mating side

Pin No.	Name	Direction	Function • Input/output Level	Notes
1	MDI 0+	I/O	1000BASE-T Interface	
2	MDI 0-	I/O	1000BASE-T Interface	
3	MDI 1+	I/O	1000BASE-T Interface	
4	MDI 1-	I/O	1000BASE-T Interface	
5	MDI 2+	I/O	1000BASE-T Interface	
6	MDI 2-	I/O	1000BASE-T Interface	
7	MDI 3+	I/O	1000BASE-T Interface	
8	MDI 3-	I/O	1000BASE-T Interface	
9	SYNC OUT	OUT	CMOS level, 5V	Isolation
10	SYNC OUT RTN	OUT	SYNC output signal return	Ground isolation
11	IRIG-B OUT	OUT	IRIG-B (AM) , 1Vp-p to10Vp-p	Isolation transformer
12	IRIG-B OUT RTN	OUT	IRIG input signal return	Isolation transformer
13	TRIG OUT A	OUT	Current loop	Isolation
14	TRIG OUT C	OUT	Current loop	Isolation
15	EPO IN	IN	TTL	Isolation
16	EPO IN RTN	IN	EPO input signal return	Ground isolation
17	PWRCNT OUT	OUT	Open (Max voltage tolerance 5.5V), Short	Isolation
18	PWRCNT OUT RTN	OUT	PWRCNT output signal return	Ground isolation
shell	FRAME GND	—	Frame ground	

■ PORT 1 to 4 connector

Application	Connect the Q1m/Q1v camera ant the Q5 with the Q-Cam remote cable	
Model	LEMO EGA.2B.318	
Compatible plug	LEMO FGA 2B.318	
ETHER	1000BASE-T (IEEE802.3ab), isolation	
SYNC OUT	Signal level:	5VCMOS output, isolation ● IRIG B DCLS output ● EST output
	Function:	Set to EST mode, H -> L to start exposure when in the ARM or REC mode and film a single image Signal level saved with the image during EVENT input
DC OUT	Power voltage:	DC 30V
	Power supply:	30W
	Power protection:	Overcurrent Internal protection circuit About 2A
TRIG OUT	Signal level:	5V CMOS output, isolation
	Function:	Trigger enabled with H -> L
EPO/ARM Status IN	Signal Level:	TTL level, 5V pullup, isolation L level: -0.5VDC (minimum applied voltage) to 0.8VDC H level: 2.0VDC to 5.5VDC (maximum applied voltage)
	Function:	Descending(H -> L): Start exposure Ascending(L -> H): End exposure
PWRCNT OUT	Signal level:	Switch circuit, isolation
	Function:	Open (Maximum allowable voltage 5.5V): Power ON Short: Power OFF

Pin Configuration



From the connector mating side

Pin No.	Name	Direction	Function • Input/output Level	Notes
1	MDI 0+	I/O	1000BASE-T Interface	
2	MDI 0-	I/O	1000BASE-T Interface	
3	MDI 1+	I/O	1000BASE-T Interface	
4	MDI 1-	I/O	1000BASE-T Interface	
5	MDI 2+	I/O	1000BASE-T Interface	
6	MDI 2-	I/O	1000BASE-T Interface	
7	MDI 3+	I/O	1000BASE-T Interface	
8	MDI 3-	I/O	1000BASE-T Interface	
9	SYNC OUT	OUT	CMOS LEVEL, 5V	Isolation
10	SYNC OUT RTN	OUT	SYNC output signal return	Isolated ground
11	DC OUT	OUT	DC +30V output	Camera power
12	DC OUT RTN	OUT	DC +30V return	Camera power
13	TRIG OUT	OUT	CMOS LEVEL, 5V	Isolation
14	TRIG OUT RTN	OUT	TRIG output signal return	Isolated ground
15	EPO IN	IN	TTL	Isolation
16	EPO IN RTN	IN	EPO input signal return	Isolated ground
17	PWRCNT OUT	OUT	Open (maximum voltage tolerance 5.5V), short	Isolation
18	PWRCNT OUT RTN	OUT	PWRCNT output signal return	Isolated ground
shell	FRAME GND	—	Frame ground	

Shape, Environment, Application Standards

■ Dimensions

Exterior Dimensions (W×H×D)	About W245×H48×D166mm (excluding the connector and protruding parts)
Unit weight	About 2.2kg (Q-HUB unit only)

■ Environment

Operating temperature and humidity	0 to 40°C, 30 to 80%RH (no condensation)
Storage temperature and humidity	-10 to 60 °C, 20 to 80%RH (no condensation)
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
Impact	Half-sine, 11msec, 100G, 6 shafts total of 1,000 times

■ Application Standards

Safety Standards	EN60950
Electromagnetic Compatibility	EN55022, EN55024 FCC Part 15 Class A, KN32, KN35

Main Options

■AC POWER SYSTEM

Exterior Dimensions (W×H×D)	About 120 × 49.3 × 250 mm (not including the connector and such)
Weight	About 1.4 Kg
Operating temperature and humidity	0 to 70°C, 5 to 95%RH (no condensation)
Storage temperature and humidity	-40 to 85°C, 5 to 95%RH (no condensation)
Connector	Camera side: NANABOSHI NET-243-RF AC side: AC3 pin connector
Input	AC100 to 240V, 47 to 63Hz
Output	DC28V, maximum14.29A

■AC Power System - Q-HUB DC Cable

Length	3.0 m
Cable diameter	Approximately 8.5mm
Plug	AC power system side: NANABOSHI NET-243-PM Q-HUB side: LEMO FGG.2B.303

■Q-Cam Remote

Length	1m , 3m, 5m, 7m, 10m, 15m, 20Am
Cable diameter	Approximately 9.2mm
Plug	Q-HUB, camera side: LEMO FGA.2B.318 Clip to prevent cable from unplugging (locking clip) attachment

■ J3 Splitter Cable

Length	0.5 m	
Plugs	Camera side:	LEMO FGG.2B.318
	ETHER:	RJ45 receptacle
	EST2:	BNC plug
	IRIG-B:	BNC plug
	TRIG2:	BNC plug
	EPO:	BNC plug
	PWRCNT:	BNC plug

■ J3 Splitter Cable (BNC Receptacle)

Length	0.5 m	
Plugs	Camera side	LEMO FGG.2B.318
	ETHER:	RJ45 receptacle
	EST2:	BNC receptacle
	IRIG-B:	BNC receptacle
	TRIG2:	BNC receptacle
	EPO:	BNC receptacle
	PWRCNT:	BNC receptacle

■ Simple J3 Cable

Length	0.5 m	
Plugs	Camera side:	LEMO FGG.2B.318
	ETHER:	RJ45 receptacle

■ GX-HUB (Anti-G Model)

Number of GX, HX camera connections	4 units	
Power input	DC20-32V Energy consumption: 12W maximum (Depending on the AC power system sold separately)	
Power switch	Yes, with GX-HUB and camera ON/OFF function	
Exterior Dimensions	About W280 x H75 x D230 mm (excluding the connector and protruding parts)	
Weight	About 4.1 kg (including mounts)	
Operating temperature and humidity	-10 to +40°C, 20 to 80%RH, no condensation	
Storage temperature and humidity	20 to +60°C, 20 to 80%RH, no condensation	
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE 514.2-2A	
Impact	Half-sine, 11 msec, 100G	
Connector	● Individual input (BNC connector x 3) IRIG IN, TRIG IN, EST IN ● GXSYS (LEMO connector EGG.2B.318): Splitter input/output with the GX-HUB, or J3 cable (Gbit Ethernet, EPO: 4 ports OR output, IRIG IN, TRIG IN, EST IN, POWER CONT) ● FXSYS (MIL connector ACT90MC35SA): Connect with the fx series M-HUB (corresponds to the fx series camera) ● Priority of FXSYS>GXSYS> individual input ● PORT 1 to 4 (LEMO connector FWG.2B.318) 4 port. Connect with the GX series camera J3 connector or the GX-HUB GXSYS and GX remote cable	
LED display	IRIG, TRIG, EST, LINK (Gbit Ethernet) , POWER	
Application Standards	Safety Standards:	EN60950
	Electromagnetic Compatibility:	EN55022, EN55024,FCC Part 15 Class A, KN32, KN35

■ GX Remote cable (for the GX-HUB)

Length	3m , 5m, 7.5m, 10m, 15m, 25m, 35m, 50m, 75m, 100m
Cable diameter	Approximately 9.2mm
Plugs	Q-HUB, camera side: LEMO FGG.2B.318 GX-HUB side: LEMO PHG.2B.318

■ GX-HUBi

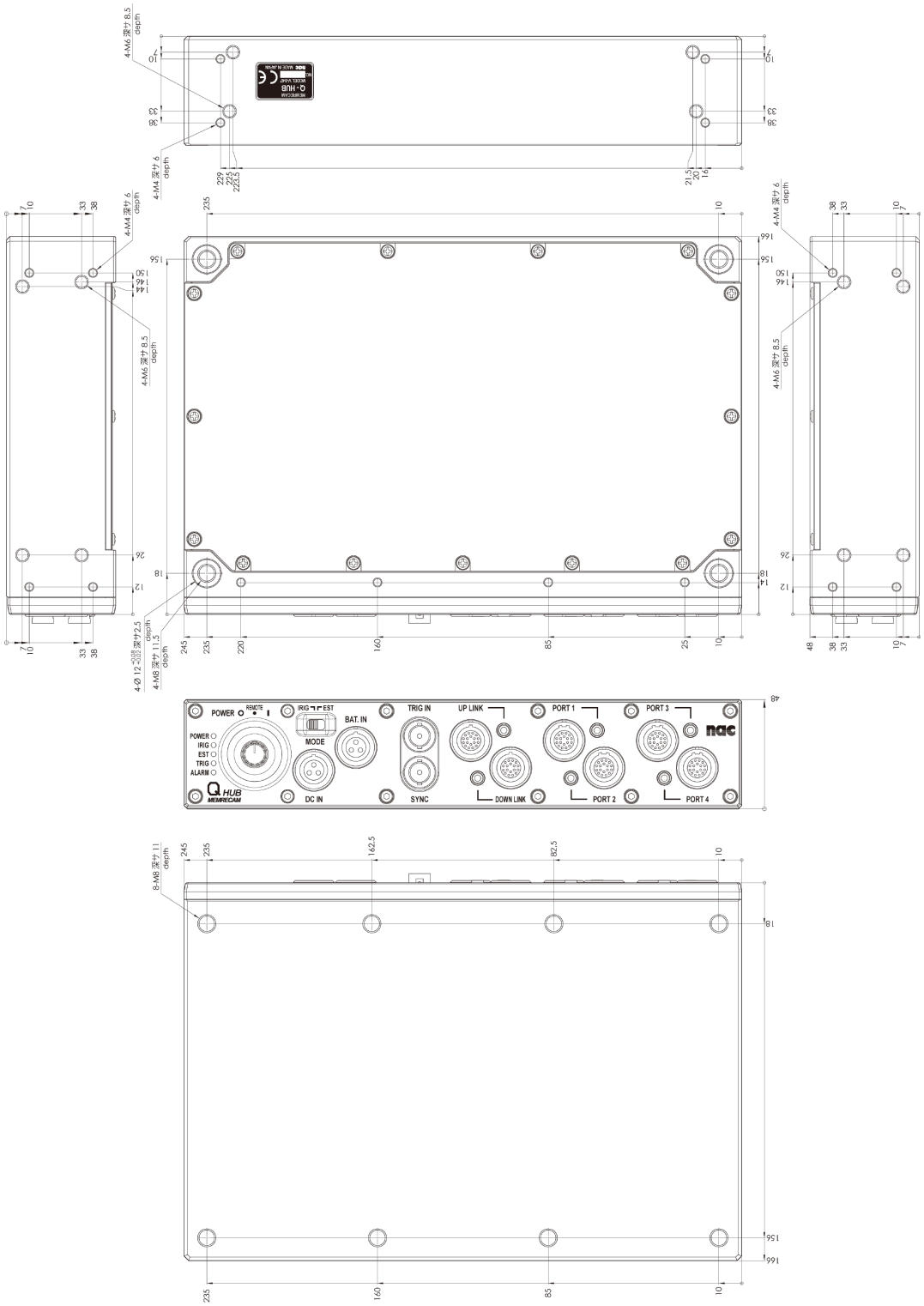
Number of GX, HX camera connections	4 units
Power input	DC20-32V Energy consumption: 12W maximum (Depending on the AC power system sold separately)
Power switch	Yes, with GX-HUB and camera ON/OFF function
Exterior Dimensions	About W270 x H72 x D200 mm (excluding the connector and protruding parts)
Weight	About 1.6 kg (including mounts)
Operating temperature and humidity	-10 to +40°C, 20 to 80%RH, no condensation
Storage temperature and humidity	20 to +60°C, 20 to 80%RH, no condensation
Connector	● Individual input (BNC connector x 3) IRIG IN, TRIG IN, EST IN ● GXSYS (LEMO connector EGG.2B.318):Splitter input/output with the GX-HUB or J3 (Gbit Ethernet, EPO: 4ports OR output, IRIG IN, TRIG INT IN, POWER CONT) ● Priority of GXSYS> individual input ● PORT 1 to 4 (LEMO connector FWG.2B.318) 4ports. Connect with the GX series camera J3 connector or the GX-HUB GXSYS and J3 remote cable
LED display	IRIG, TRIG, EST, LINK (Gbit Ethernet) , POWER
	Safety Standards: EN60950
	Electromagnetic Compatibility: EN55022, EN55024,FCC Part 15 Class A

■ GX Remote cable (for the GX-HUBi)

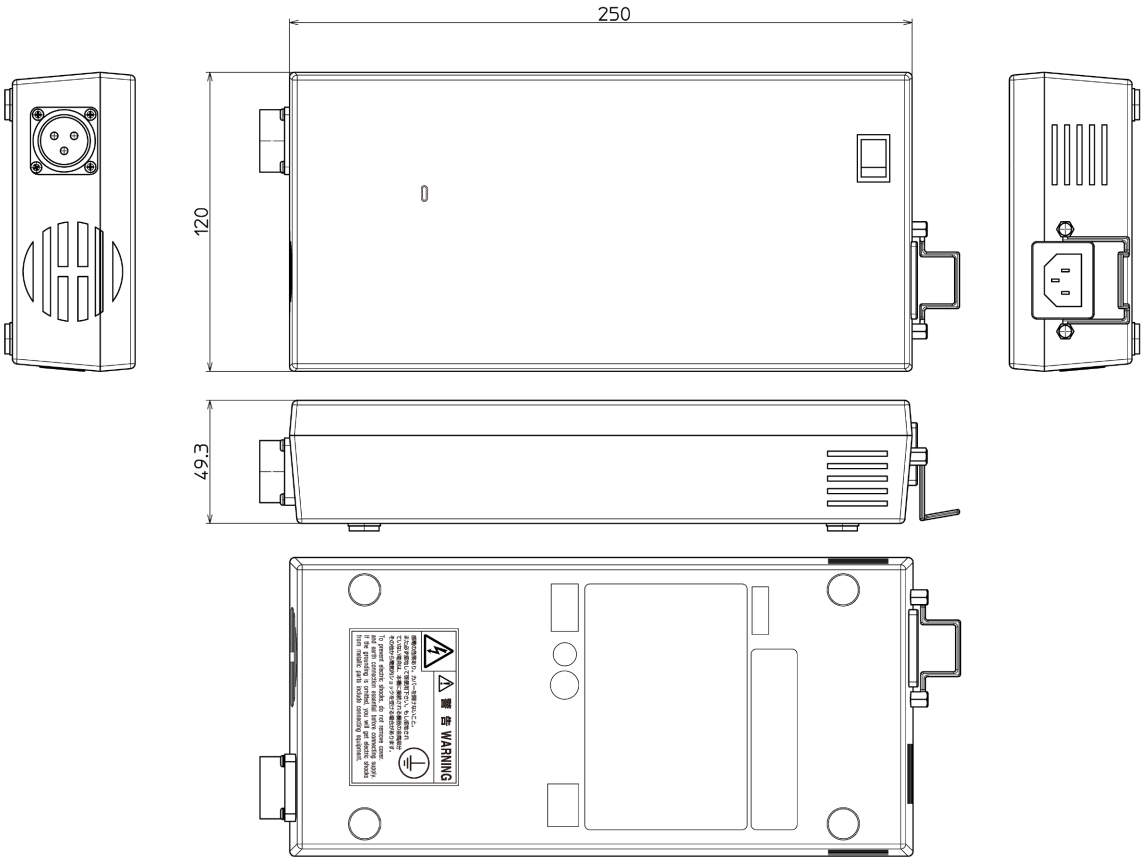
Length	1.5m ,3m , 5m, 7.5m, 10m, 15m, 20m, 25m, 30m, 35m, 40m, 45m, 50m, 55m, 60m, 65m, 70m, 75m, 80m, 85m, 90m, 95m, 100m
Cable diameter	Approximately 9.2mm
Plugs	GX-HUB, Q-HUB side: LEMO FGG.2B.318

Dimensional Drawings

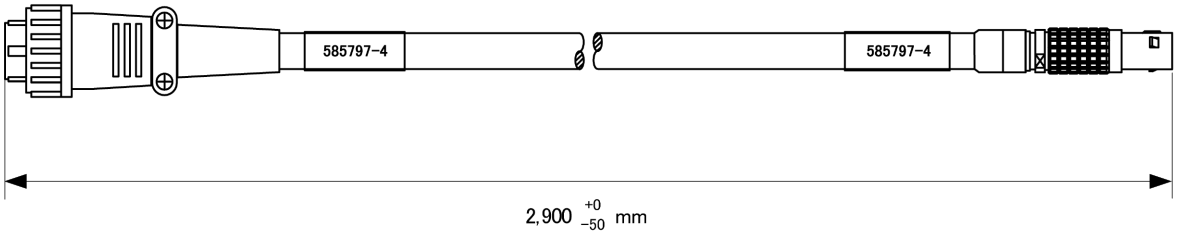
■ Q-HUB



■ AC POWER SYSTEM

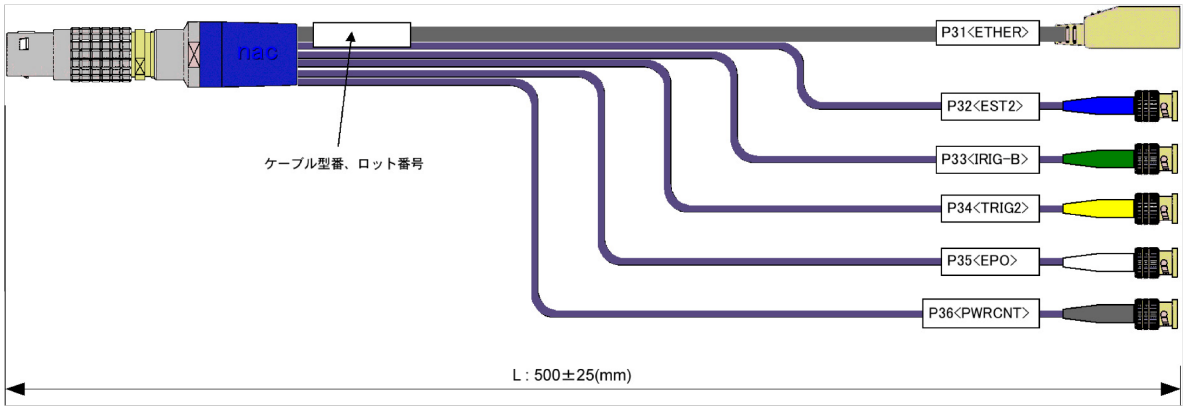


■ AC Power System - Q-HUB DC Cable

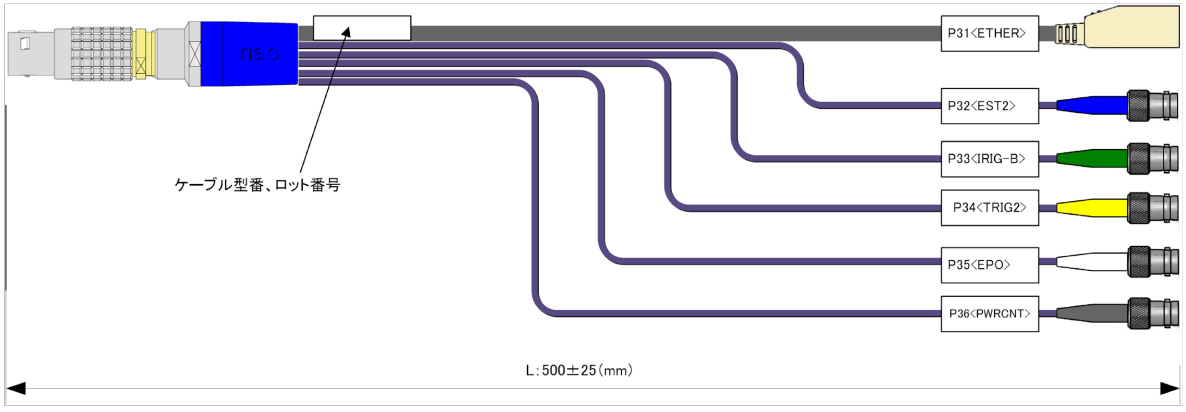


■ Q-Cam Remote cable

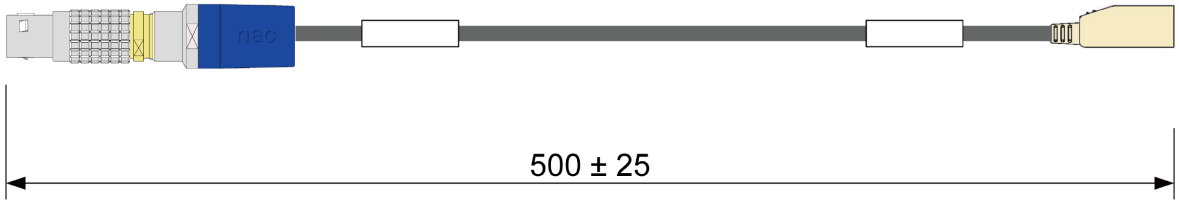
■ J3 Splitter Cable



■ J3 Splitter Cable　(BNC Receptacle)



■ Simple J3 Cable



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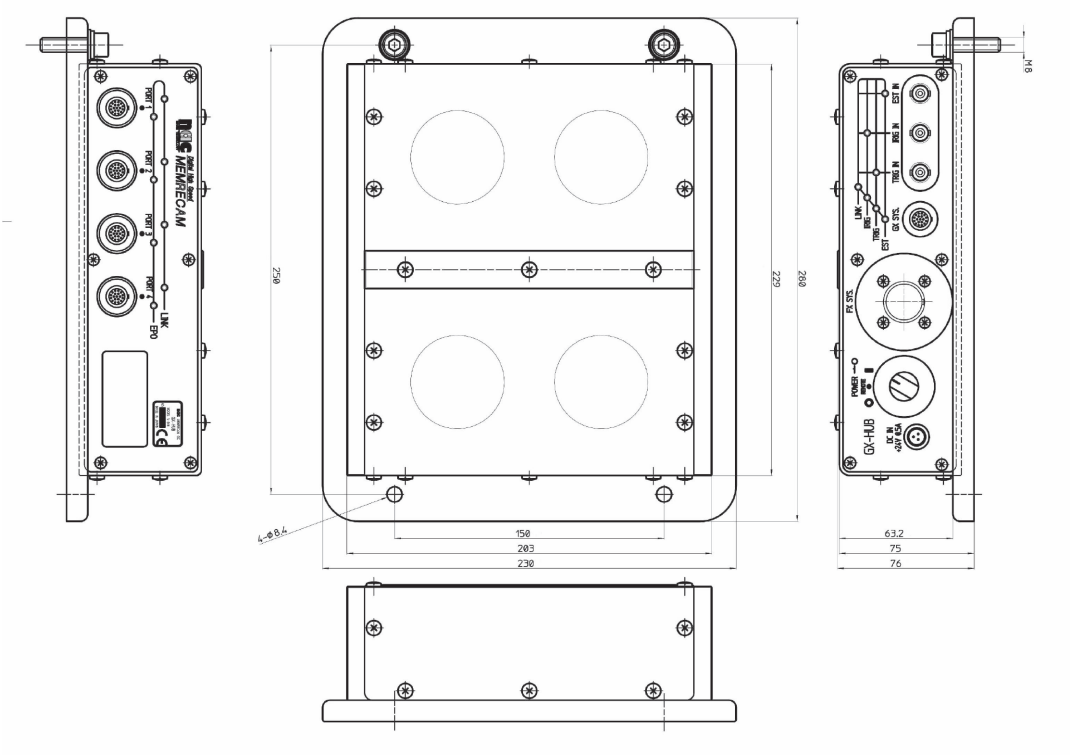
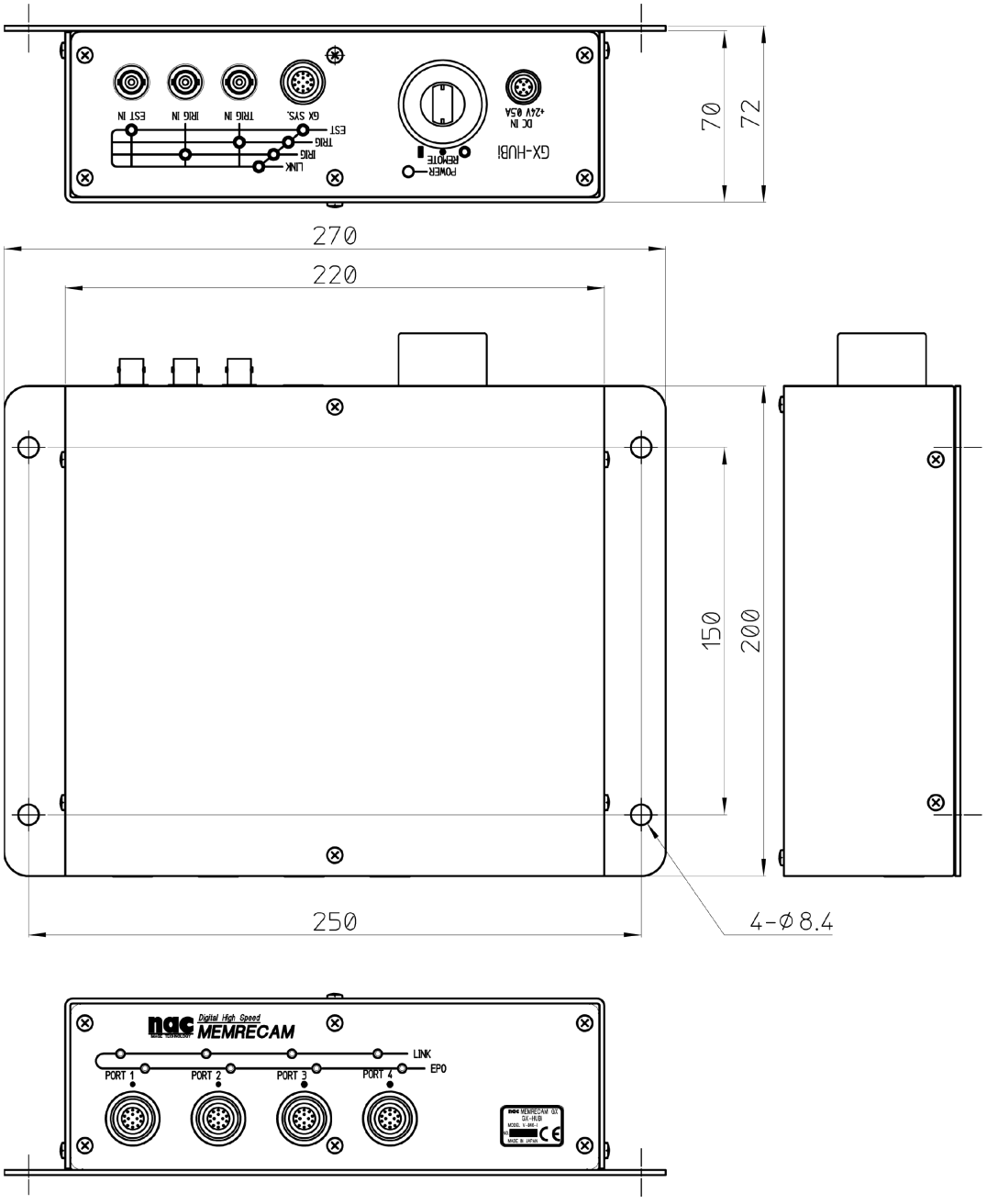
■ GX-HUB



■ GX Remote cable (for the GX-HUB)

■ GX-HUBi



■ GX Remote cable (for the GX-HUBi)

7

Q-HUB BATTERY PACK

Features

Compact battery option for the Q-HUB.

Mounting to the Q-HUB

The compact battery can be mounted to the top of the Q-HUB.

Can be used vertically with the special option

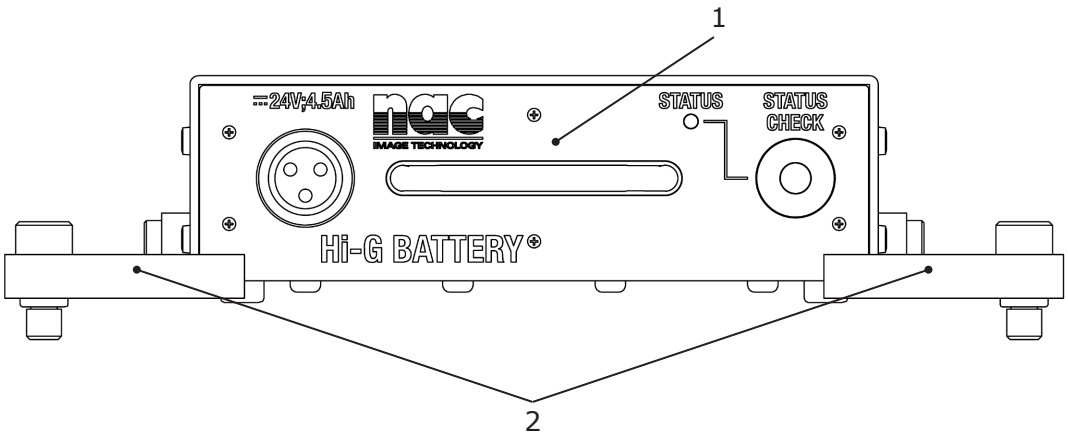
Can be used vertically with the Q-HUB with the special option

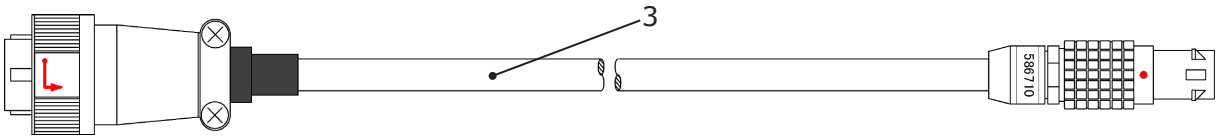
Verify the Standard Components

he Q-HUB BATTERY PACK includes the following.

Make sure all are included.

■ Q-HUB BATTERY PACK





1 24V Hi-G BATTERY

2 BATTERY ADAPTER

3 Q-HUB BATT CABLE

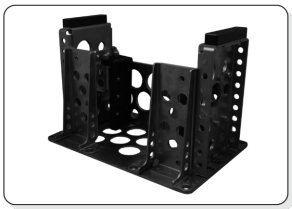
Attention

- Q-HUB battery option. Do not use on other equipment.
- Use the dedicated charger (24V BATTERY CHARGER SYSTEM: Model ST-844) for charging.

Main Options

The following main Options are available.

● 24V BATTERY CHARGER SYSTEM



● BRACKET BATTERY

- 24V BATTERY CHARGER SYSTEM: Q-HUB BATTERY PACK charger
- BRACKET BATTERY: Q-HUB and Q-HUB BATTERY PACK fixed metal fittings. Can be mounted vertically.

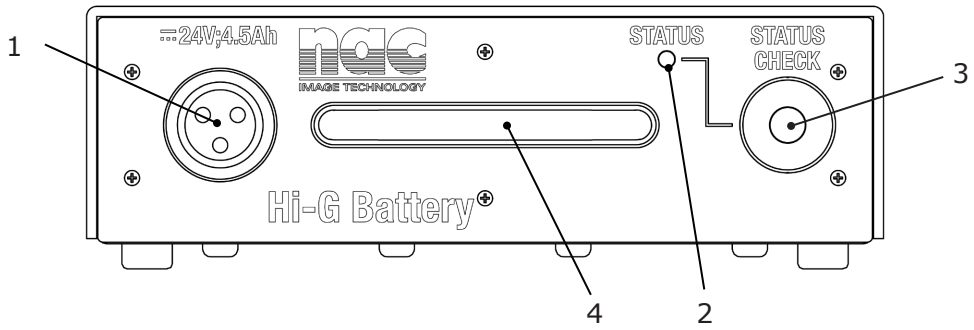
Attention

- Please refer to the enclosed user's guide for details on the 24V BATTERY CHARGER SYSTEM.

External Appearance and Names to Each Part

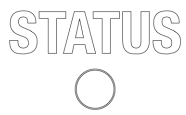
■ 24V Hi-G BATTERY External Appearance and Names

Front



1 DC OUT connector for charger
2 Status display light
3 Status check button
4 Handle

Status Display Light



Normally not lit. After connecting the Q-HUB to a power source and pressing the status check button, the battery status can be confirmed.

Light	Status	Operation	⏩🕮
STATUS	Green	Remaining H	—
	Orange	Remaining M	—
	Red	Remaining L	—

Attention

- Since there are individual differences between batteries and the ambient temperature has an effect, there is no proper display. Use as a target.

Charging

Charges the Q-HUB BATTERY PACK.

■ Charging

Charges the 24V BATTERY CHARGER SYSTEM sold separately.

Attention • Make sure to use the dedicated 24V BATTERY CHARGER SYSTEM for charging.

1 Turn the power switch OFF

• Turn the power switch for the battery charger OFF "O"

2 Connect the cable from the battery charger to the 24V Hi-G battery

• Line up the indentations on the charger connector and the cable plug and plug straight in (1).

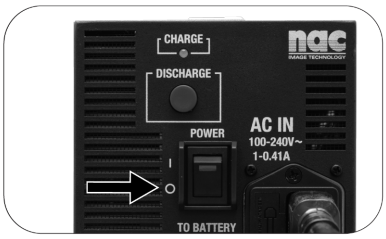
• Plug the AC cable straight in to the AC IN connector (2).

3 Plug the AC cable into an outlet

4 Turn the power switch ON

• Turn the battery charger power switch ON "I". The switch LED will light up in green.

• CHARGE will light up in red.



5 Charging is complete once CHARGE is lit in green

• Turn the battery charger power switch OFF "O".

6 Remove the cable from the 24V Hi-G battery

• Rotate the shell of the connector to the left (1) and pull straight out (2).

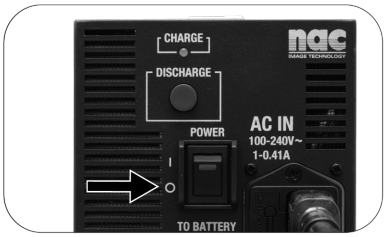
Attention

- When pulling out the cable, make sure the battery charger power switch is OFF.
- Do not open the cover to the battery charger or the 24V Hi-G battery. The locations generating high voltage are dangerous.
- Make sure it is grounded. If not grounded, electrical shock may occur.
- If using a 3P-2P convertible plug to connect to the power outlet, connect the grounding wire of the convertible plug to an external grounding source.
- Since this is a dedicated battery charger for the 24V Hi-G battery, do not use on other equipment.
- Do not charge the 24V Hi-G battery immediately after using.
  (Charge about 2 hours after using so the temperature of the 24V Hi-G battery drops)
- Do not recharge the 24V Hi-G battery after fully charging it.
  (If the 24V Hi-G battery gets hot, the protective circuit may become enabled, making it impossible to charge).

■ Cancellation of the Memory Effect

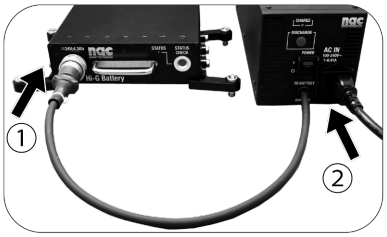
If repeatedly charging and discharging with a shallow charge (when the status display light is green), the discharge capacity will be reduced (shortened time of use), which will cause a memory effect. If there is a memory effect, cancel using the following procedure.

Attention ● Make sure to use the dedicated 24V battery charger system.



1 Turn the power switch OFF

● Turn the power switch for the battery charger OFF "O"



2 Connect the cable from the battery charger to the 24V Hi-G battery

● Line up the indentations on the charger connector and the cable plug and plug straight in (1).

● Plug the AC cable straight in to the AC IN connector (2).

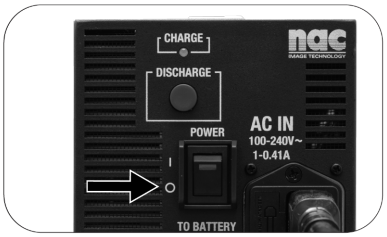
3 Plug the AC cable into an outlet

4 Turn the power switch ON

● Turn the battery charger power switch ON "I" (1) and press the DISCHARGE button (2).

● CHARGE will flash green.

● Once discharging is completed, CHARGE will automatically switch from flashing green to red and charging will start.



5 Charging is complete once CHARGE is lit in green

● Turn the battery charger power switch OFF "O".

6 Remove the cable from the 24V Hi-G battery

- Rotate the shell of the connector to the left (1) and pull straight out (2).

Attention

- If repeatedly excessively discharging the battery, the battery life will be reduced so avoid overdischarging.
- Discharging quickens after executing so if something prevents use, immediately replace. Replacement cannot be performed by users so contact the store or our company.

Connect to the Q-HUB

The 24V Hi-G battery connects to the Q-HUB.

Attention • Turn the Q-HUB power OFF to connect.

1 Install the battery adapter

• Tighten the 6 screws on the side to install the battery adapter.

2 Secure to the Q-HUB

• Use the 4 screws on the battery adapter to secure the 24V Hi-G battery to the Q-HUB.

3 Connect the cable

• Connect the Q-HUB battery cable to the 24V Hi-G battery and the Q-HUB BAT.IN.

Mount the Bracket Battery

Use the bracket battery (option) to mount in a vertical direction.

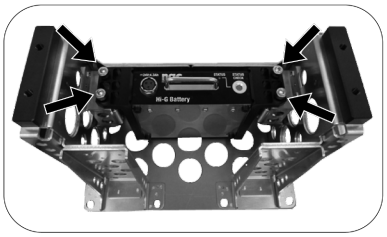
Attention • Turn the Q-HUB power OFF to connect.

1 Remove BATTERY ADAPTER

• Loosen 6 screws on the side to remove BATTERT ADAPTER.

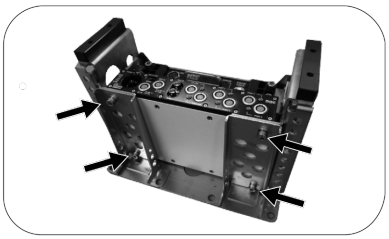
2 Mount the bracket adapter

• Tighten the 6 screws to secure the adapter with the bracket battery to the 24V Hi-G battery.



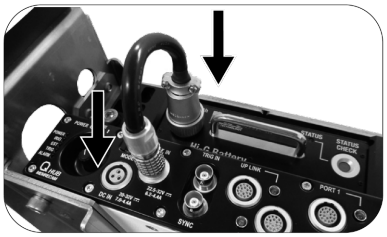
3 Secure to the bracket battery

• Tighten the 4 screws mounted on the bracket battery to secure the 24V Hi-G battery.



4 Secure the Q-HUB

• Mount the Q-HUB to the bracket battery and tighten the 4 screws (with the bracket battery) to secure.



5 Connect the cable

• Connect the Q-HUB battery cable to the 24V Hi-G battery and the Q-HUB.

Specifications

■ 24V Hi-G BATTERY

Battery	Battery Used:	NiMH battery
	Nominal Voltage:	DC 24V
	Nominal Capacity:	4.5Ah
	Life:	1 year (Target replacement at 1 year due to the tremendous variation in ambient temperature and use environment)
Drive Time	About 50 minutes (reference value with Q-HUB+Q1m/Q1v 4 (no options), new battery, fully charged)	
Charge Time	About 2 hours 20 minutes (using the dedicated charger)	
Refresh Time	About 1 hours 50 minutes (using the dedicated charger)	
External Dimensions (W×H×D)	About W158×H47×D135mm (excluding the connector and protruding parts)	
Weight	About 2.1kg (excluding the accessories)	
Operating Temperature and Humidity	Charge: +5 to 35°C, 30 to 80%RH (no condensation) Discharge: +5 to 40°C, 30 to 80%RH (no condensation)	
Storage Temperature and Humidity	-20 to 30°C, 20 to 80%RH (no condensation)	
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE 514.2-2A	
Impact	Half sine, 11msec, 150G,6 shafts total of 1000 times	
Applicable Standards	CE, FCC	

■ Status LED

STATUS	Green:	Remaining H
	Orange:	Remaining M
	Red:	Remaining L

Attention

- Since there are individual differences between batteries and the ambient temperature has an effect, the status LED display should be used as a target.

■ DC OUT / Charge Connector

Application	DC output / charger
Model	NR-203-RF-TUV (Nanaboshi Electric Mfg. Co., Ltd.)
Plug	NR-203-PM-TUV (Nanaboshi Electric Mfg. Co., Ltd.)

Pin No.	Name	Direction	Function • Input/output Level	Notes
1	DC OUT	IN/OUT		
2	DC RTN	IN/OUT		
3	TEMP/SENSOR	OUT		

■ Connection Cable Q-HUB BATT CABLE

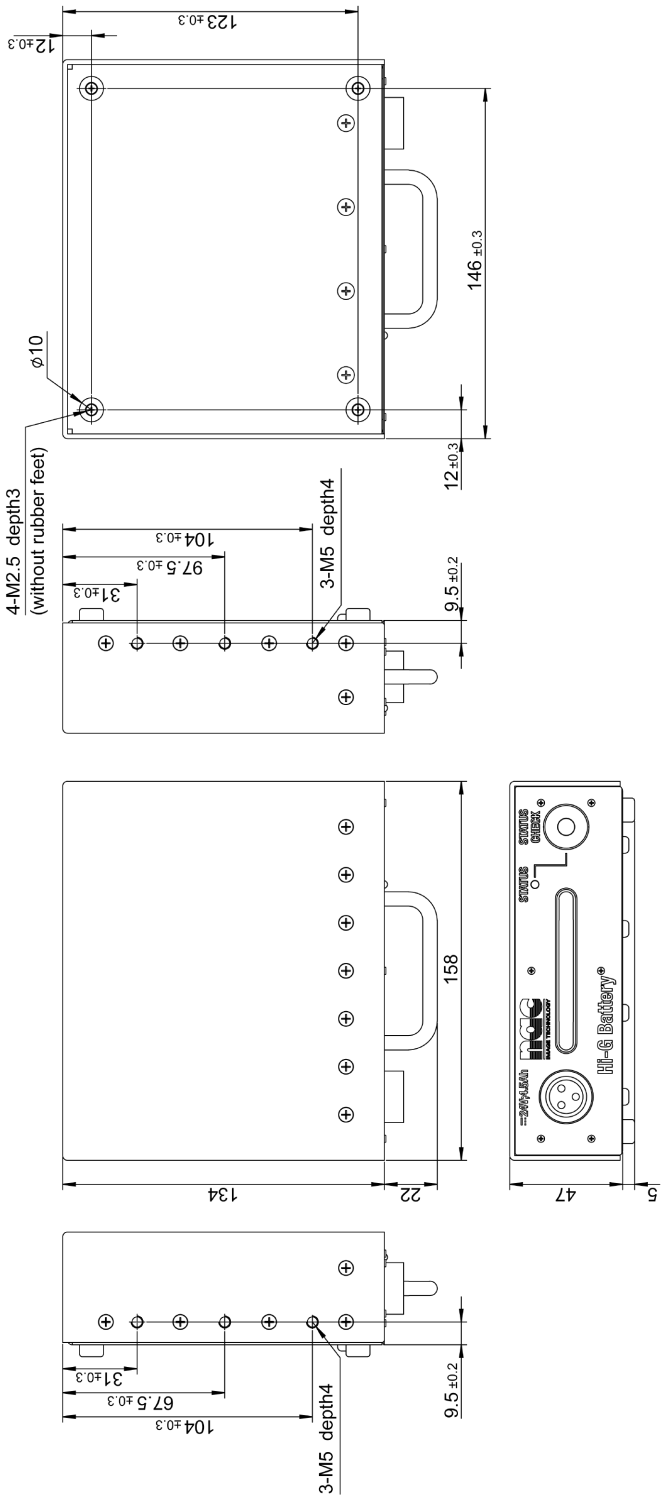
Length	0.095 m	
Cable Diameter	7.7mm	
Plug	BATTERY side:	Nanaboshi Electric Mfg. Co., Ltd. NR-203-PM-TUV
	Q-HUB side: LEMO	FGG.2B.303

■ BRACKET BATTERY (Option)

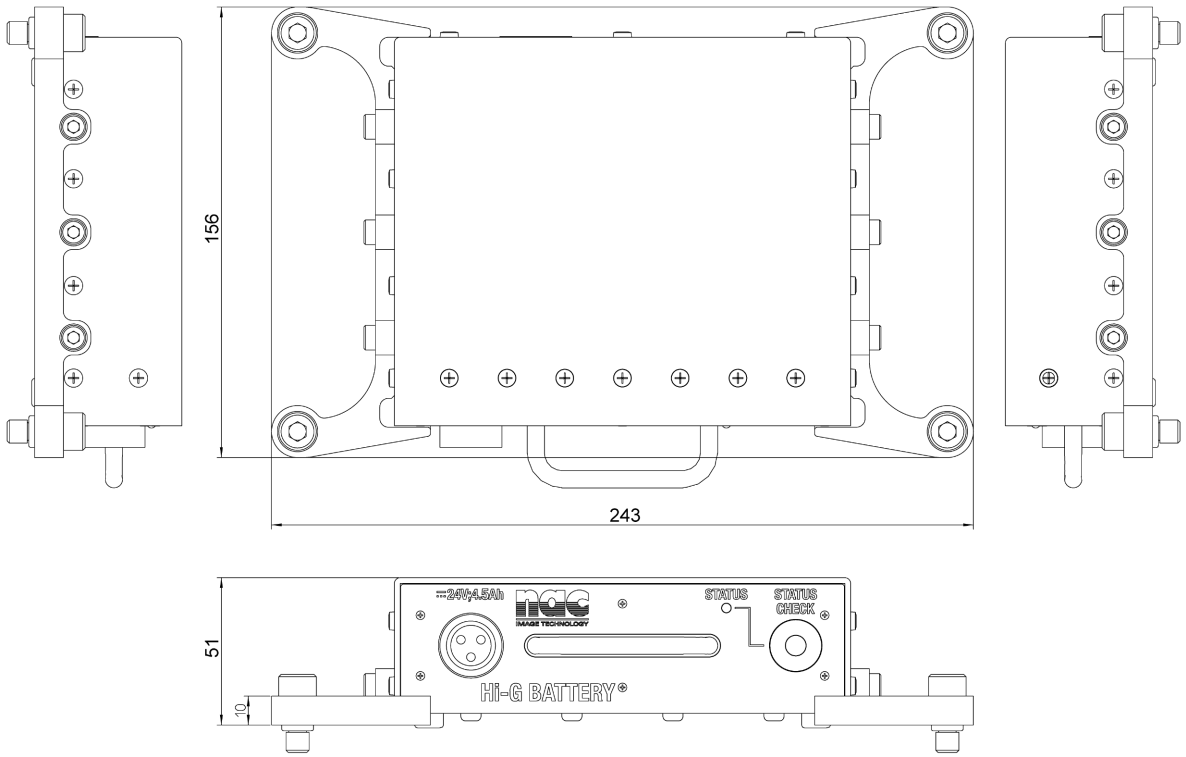
External Dimensions (W×H×D)	About W320×H225×D220mm (excluding the connector and protruding parts)
Weight	About 3kg

Dimensional Drawings

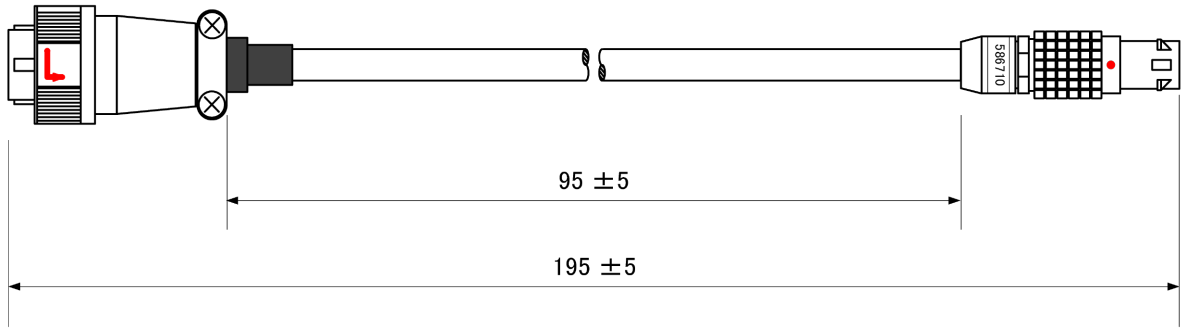
■ 24V Hi-G BATTERY



■ 24V Hi-G BATTERY (with battery adapter installed)



■ Q-HUB BATT CABLE



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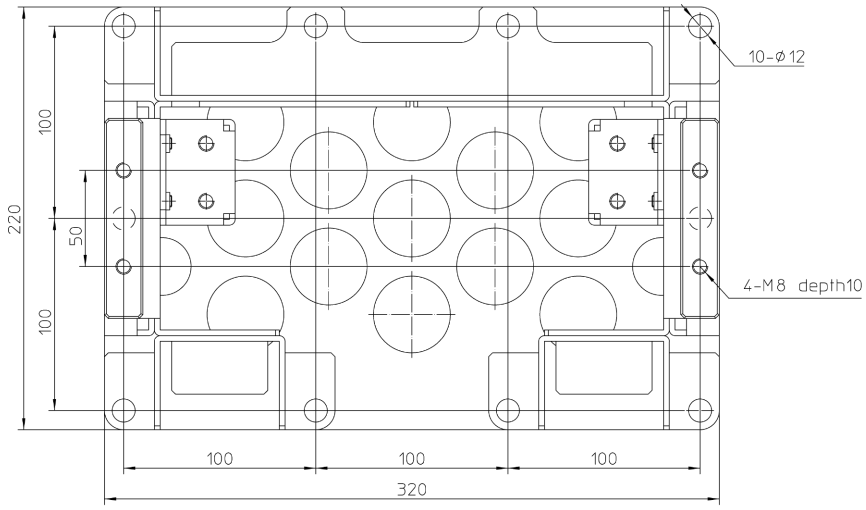
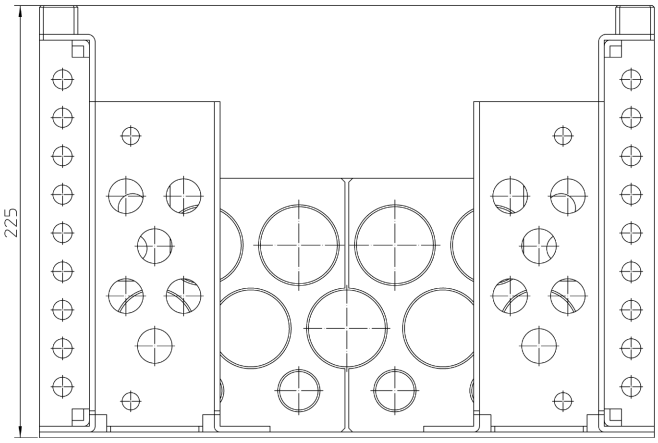
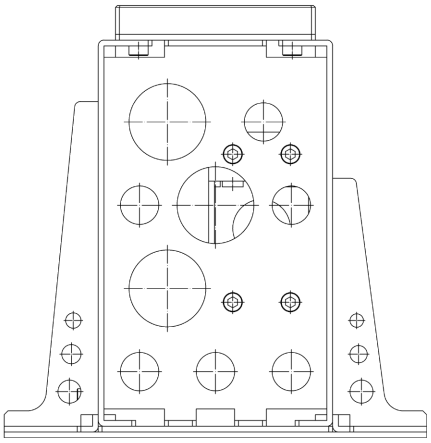
■ BRACKET BATTERY (Option)







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Contact

nac Image Technology Inc.

Manufacturer / distributor (overseas sales office)

■ USA Contact

nac Americas Inc.	
Address	193 Jefferson Ave, Suite 102 Salem, MA 01970 USA
TEL	+1-833-600-0261
FAX	
E-mail	sales@nacinc.com
Website	https://www.nacinc.com/

■ European Contact

MESSRING GmbH	
Address	Friedrichshafener Straße 4c 82205 Gilching, Germany
TEL	+49 8153 407-96-333
FAX	
E-mail	sales@messring.de
Website	https://www.messring.de

■ Japan/Asia Contact

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Address	2-11-3 Kita-Aoyama, Minato-ku Tokyo 107-0061 Japan
TEL	+81 3-3796-7903
FAX	+81 3-3796-7908
E-mail:	nacinternational@camnac.co.jp
Website:	https://www.nacinc.jp/

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