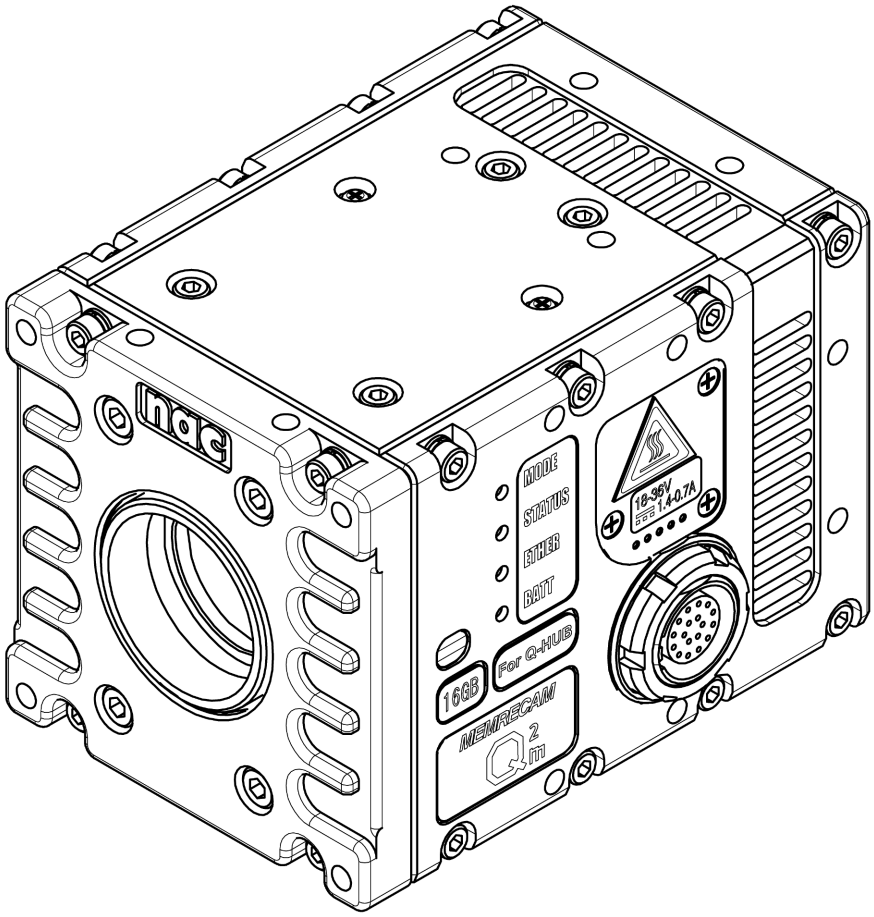
IMAGE TECHNOLOGY

800477-0B



High Speed Camera System

MEMRECAM Q2m

Model ST-865

User's Manual

・Please read the User's manual and use it correctly and safely.
・Keep the User's manual with the product.

MAY 2021

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 Q2m	MODEL V-1015
MEMREAM Q-HUB	MODEL V-847

CE marking

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

Features of This Unit

The MEMRECAM Q2m is a handheld high speed digital camera capable of high speed recording in a variety of environments.

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 Q2m is capable of recording a maximum of 2,000 frames per second at 1,920 × 1,080 pixels, and a maximum of 100,000 frames per second by reducing the vertical pixels recorded. The sensitivity is ISO 8,000 for color and ISO 32,000 for B/W.

Attention

- Above sensitivity is at 2,000fps (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 16GB. (Memory may vary according to model.)

Q2m 8GB model / 2,000pps / 1,920 × 1,080 / 8-bit recording allows for 2 seconds of high resolution, high speed shooting

Superior Performance

High speed photography requiring advanced techniques can be easily performed.

Continuous recording to the semiconductor memory and input of recording triggers ensure that phenomena that occur only accidentally can be captured and recorded.

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 Ethernet 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.

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 Q2m Firmware Ver. 1.60, Q2m Hardware Ver. E, and the MLink Ver. 1.73a 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 (Q2m)	
	• Check the input power before connecting. • During AC adapter use:AC100 to 240V/47 to 63Hz • During DC power connection:DC18 to 36V (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 theQ-HUB unit or open the cover even if the Q-HUB 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 Q-HUB becomes hotter than normal, or if smoke, odors or noises are emitted. The Q-HUB 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.)

⚠ 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 Q2m 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 (Q2m)	
	• Do not leave the camera in locations with high temperatures, such as in closed vehicles, near flame, or on top of stoves. (The Q2m 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 Q-HUBt	
	• Operating environment Do not use in areas where there is oil smoke, corrosive gases or strong magnetic fields. Do not expose to direct sunlight, rain or salt water. Do not use in areas with high levels of dirt, dust, sand or humidity.
	• Do not leave the product in hot places such as inside a car, near a fire, in front of a stove, etc. (This can cause the battery to leak and reduce the performance and life of the battery.)
	• Check the ambient temperature of the area where it will be used and stored. Operating temperature range: 0-40°C, humidity 20-80%RH, no condensation Storage temperature range: -20 to 60°C (-20 to 60°F), humidity 20 to 80% RH (20 to 80%), no condensation

⚠ Caution

Using the AC Adapter (Q2m)	
	• 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.)

⚠ Caution

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.)

Child does not play with this product	
	• Please keep children away from this product.

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 Labels

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

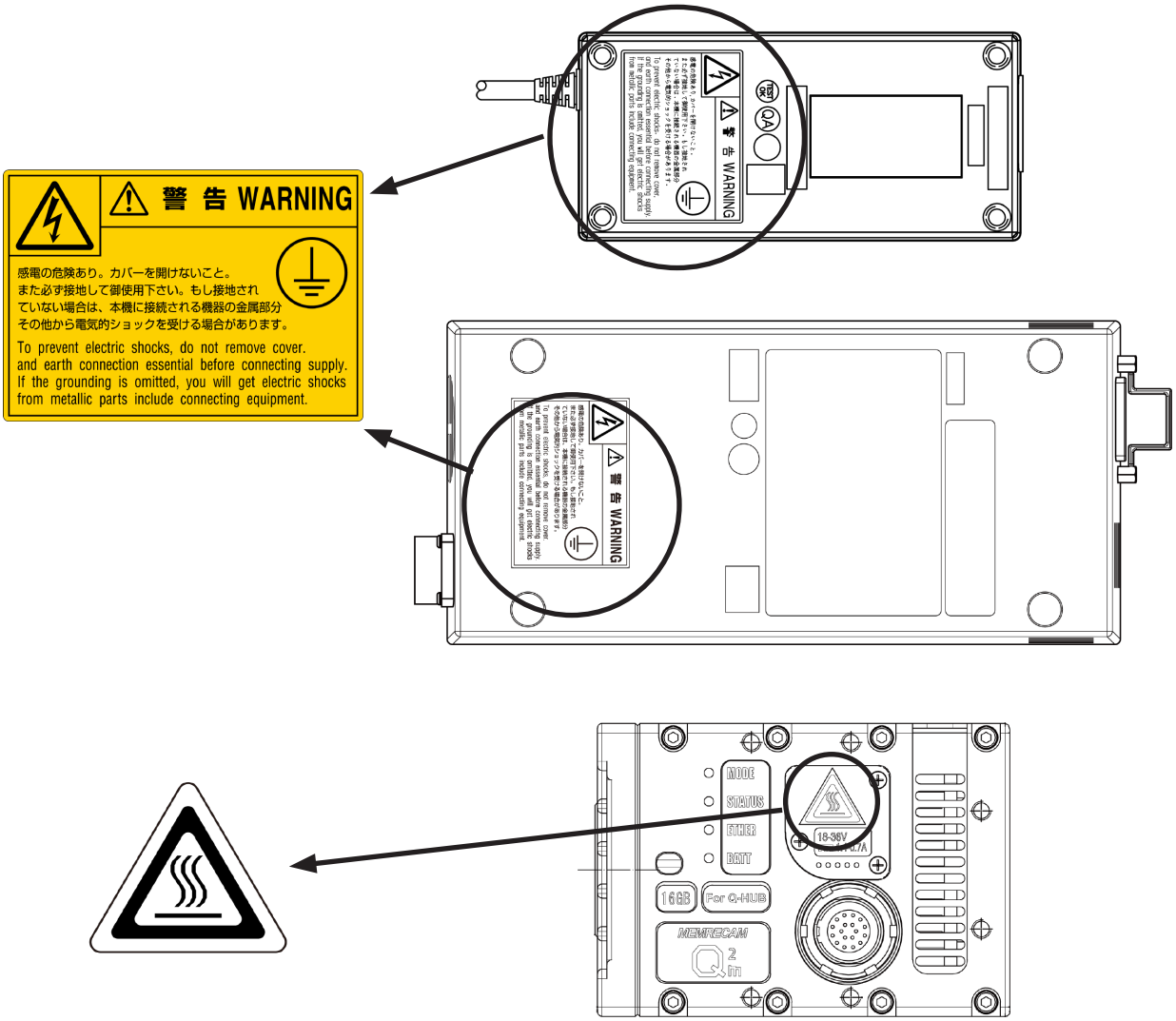
This describes the symbols shown on the warning labels.

	• 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.
	• High temperature caution symbol This symbol is displayed in areas with dangerously high temperatures if touched. The device heats up when powered and may reach high temperatures. Do not touch during operation. There is a danger of starting a fire.

The following products have a warning label on them: - AC adapter (for Q2m, Q-HUB)

- AC ADAPTER (for Q2m, Q-HUB)
- Q2m

If the label comes off or the text is not visible, please contact your store or our service center.



■ 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.

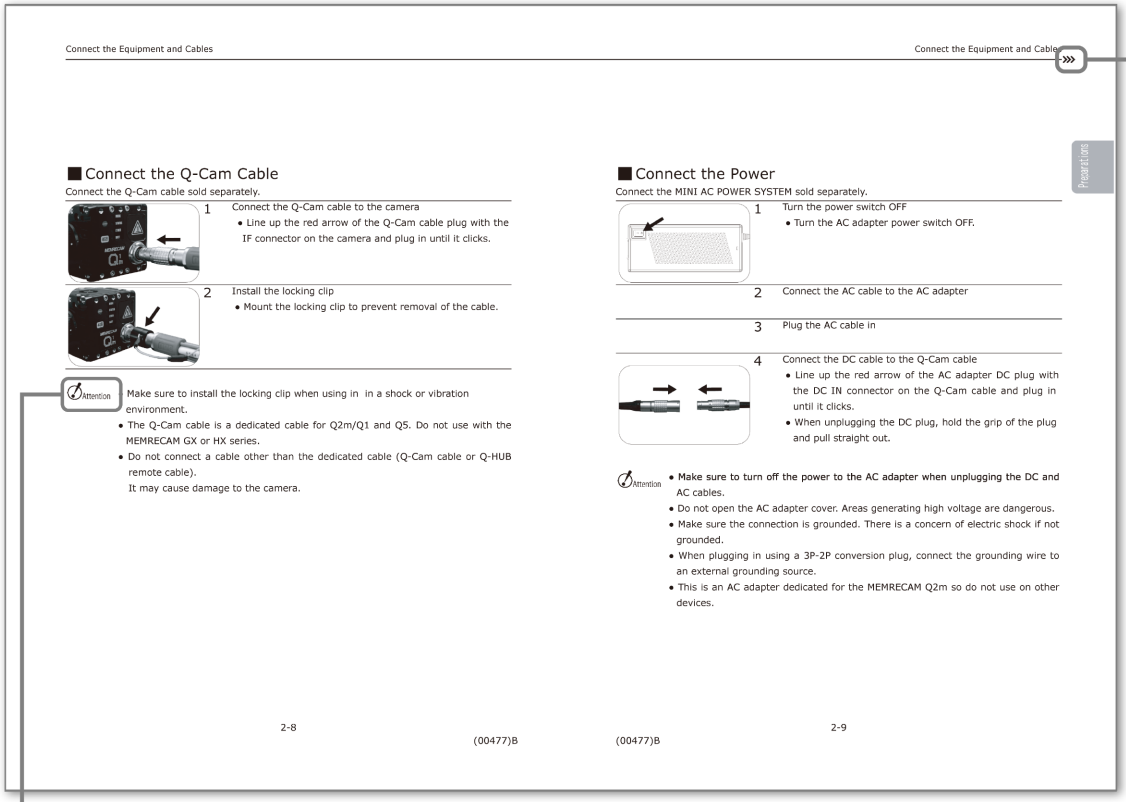
■ About maintenance

This product is cooling by the fan, and we recommend regular maintenance.
For maintenance, please consult your dealer or or our service center.

■ Warranty

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

This Booklet



Connect the Equipment and Cables

Connect the Equipment and Cables

Preparations

■ 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 in a shock or vibration environment.
- The Q-Cam cable is a dedicated cable for Q2m/Q1 and Q5. Do not use with the MEMRECAM GX or HX series.
- Do not connect a cable other than the dedicated cable (Q-Cam cable or Q-HUB remote cable).
  It may cause damage to the camera.

■ 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 Q2m so do not use on other devices.

2-8 (00477)B

(00477)B 2-9

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".

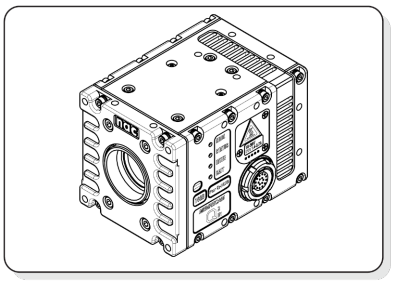
Table of Contents

1

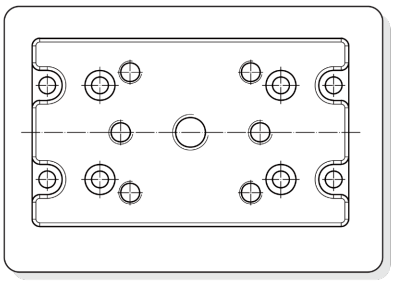
Introduction

Verify the Standard Components

The following are included as standard components of the MEMRECAM Q2m.
Make sure that all are included.



● MEMRECAM Q2m

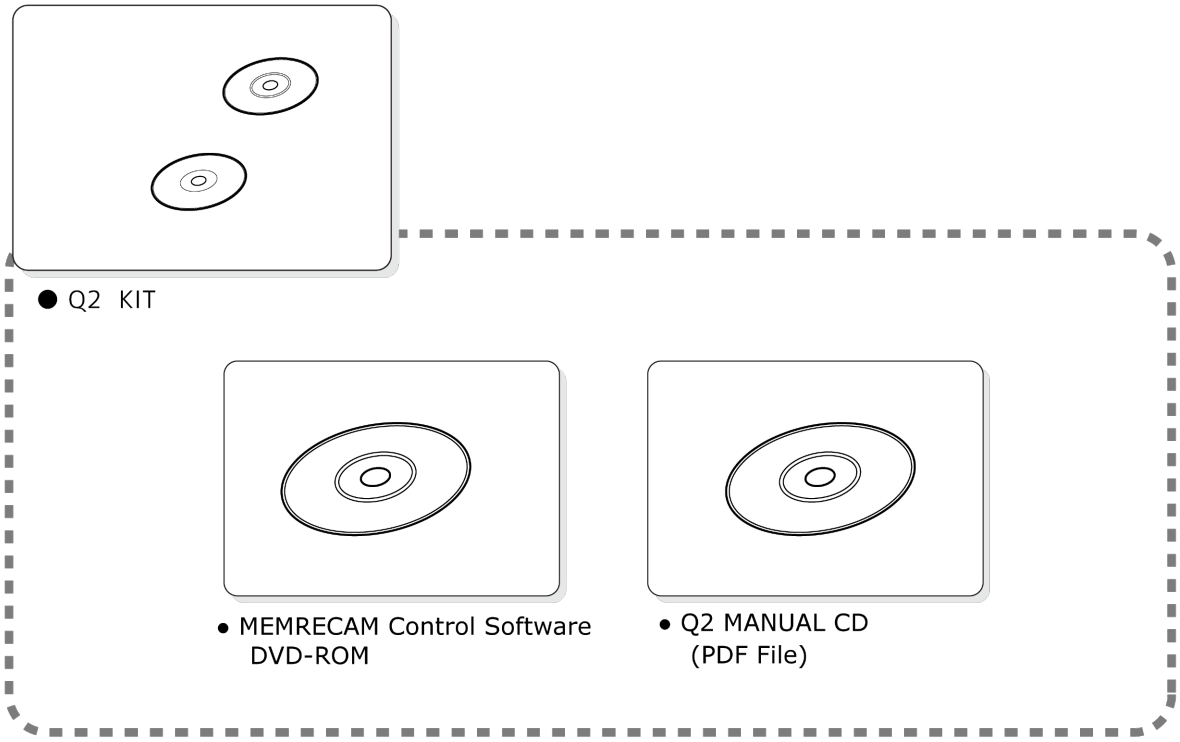


● Tripod plate

- MEMRECAM Q2m — Q2m camera unit
- Tripod plate — Plate to mount the camera to the tripod

Attention

- The MEMRECAM Q2m includes the following models.
  Memory 8GB / 16GB, color / monochrome
  Make sure the contents match the purchased model.
- Do not use in a shock/vibration environment with the tripod plate mounted.
  Make sure to secure using the camera unit screw holes.



●Q2 KIT Set of Q2m PC control software and user's guide

MEMRECAM Control Software DVD-ROM PC control software MLink DVD-ROM

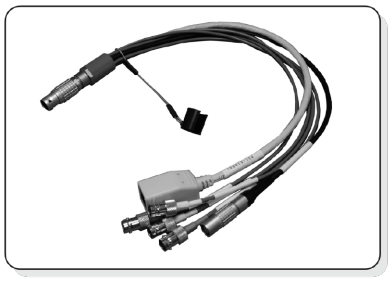
Q2 MANUAL CD Q2 user's manual (PDF file)

CHECK

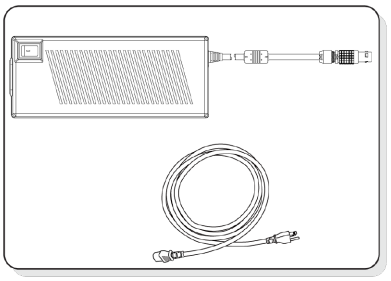
• The Q2 is operated using the MLink. Refer to the MLink user's guide for the method of operation using the MLink.

Main Options

The main options for the MEMRECAM Q2m are as follows.



● Q-Cam Cable



● MINI AC POWER SYSTEM

● Q2 Camera Case

- Q-Cam Cable — Dedicated input/output cable for the Q2m
- MINI AC POWER SYSTEM — Set of dedicated AC adapter and AC power cable for the Q2m
- Q2 Camera Case — Case that houses the Q2 unit for safe transport

Attention

- In addition to the Q2 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 ACS , HX or GX series.
- Refer to (⏭🕮 5-2) for details on Q-Hub

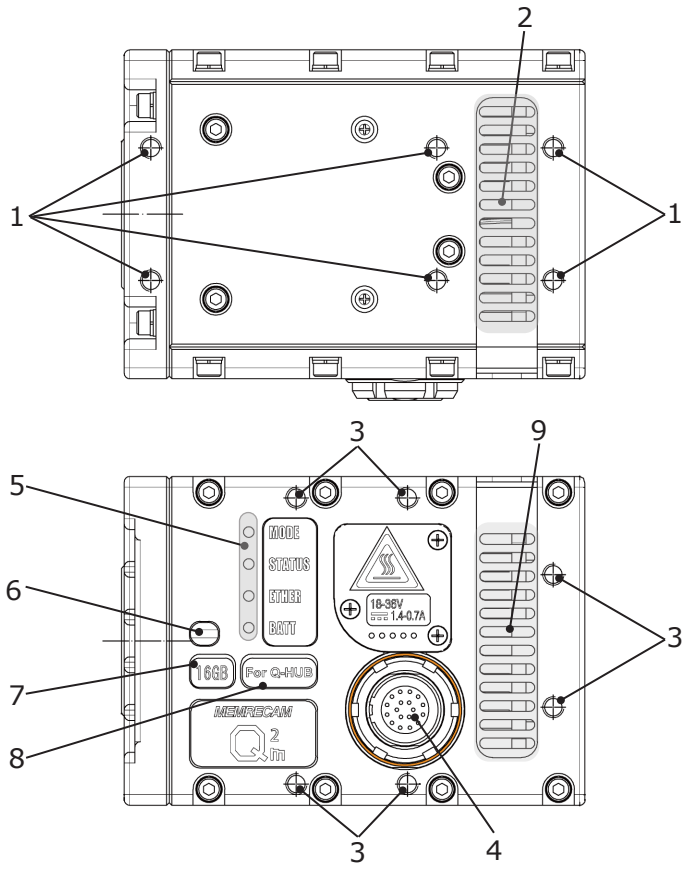
CHECK

- If there is a problem with the Q2m, use the optional ResQ ADAPTER SYSTEM and it may be possible to save the images on the Q2m 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

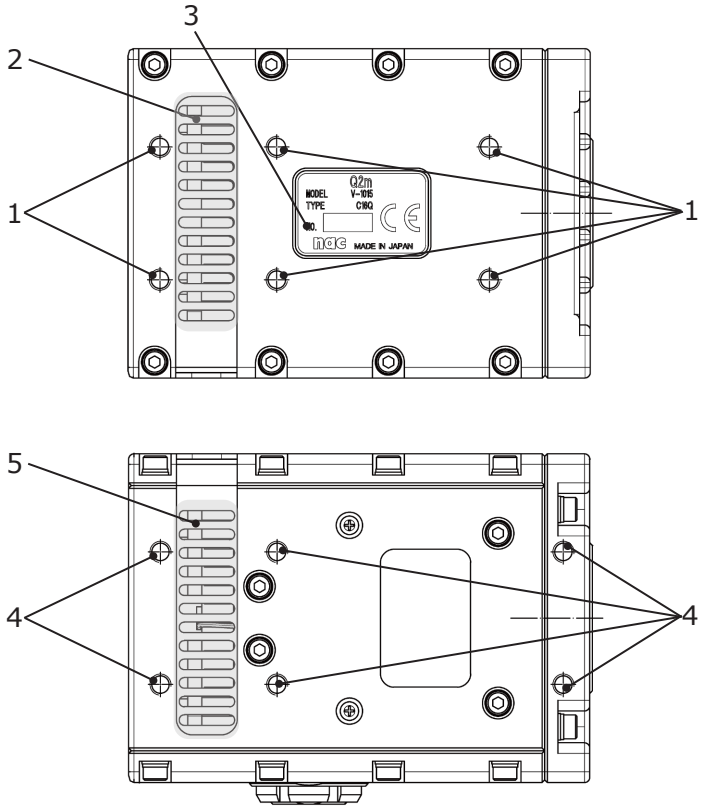


1 Screw holes (6 locations, M4 depth 4 mm)
2 Vents
3 Screw holes (6 locations, M4 depth 5 mm)
4 IF connector (with orange color ring)
5 Status LED
6 Color camera identification sticker (not used with B/W cameras)
7 Memory size sticker
8 Type stcker
9 Vents

Attention

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

Left side, Bottom

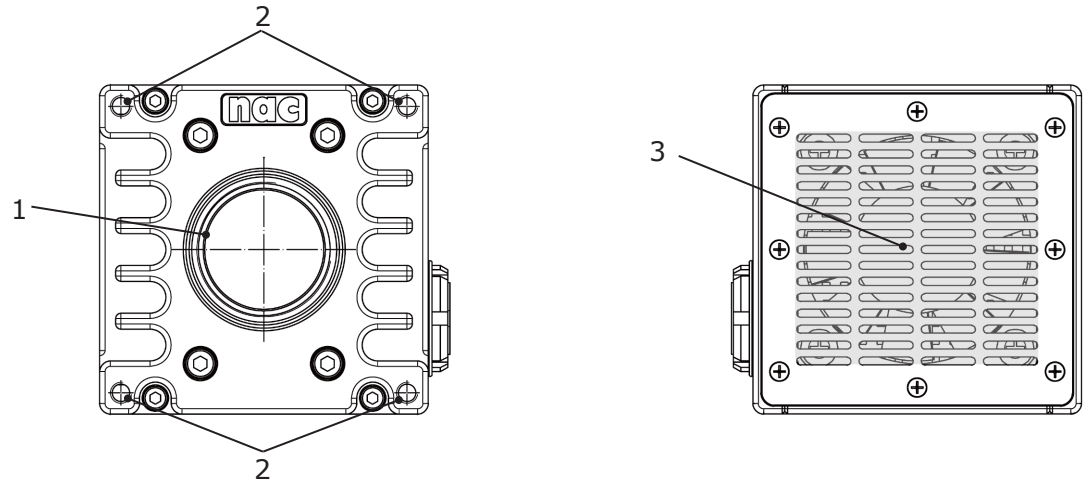


1 Screw holes (6 locations, M4 depth 4 mm)
2 Vents
3 Name plate (indicating the production number)
4 Screw holes (6 locations, M4 depth 4 mm)
5 Vents

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)

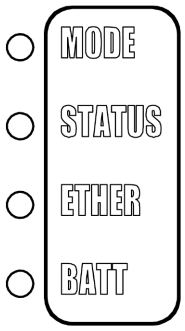
3 Air intake

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.

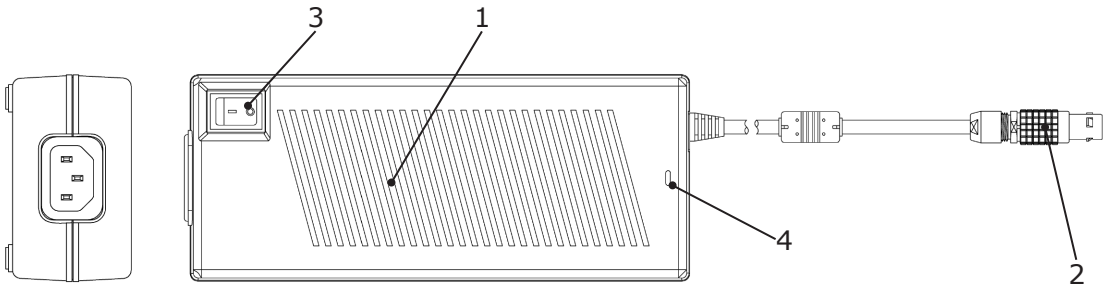


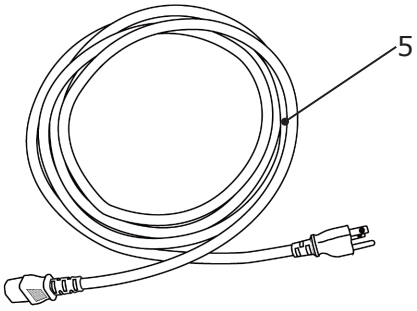
LED	Status	Operation
MODE	Orange (Blinking)	REC mode (Blinking: set to A-EST / EST mode, EST pulse input)
	Blue	STOP / READY mode
	White (Blinking)	VIEW mode (Blinking: set to A-EST /EST mode, EST pulse input)
	Magenta (Blinking)	ARM mode (camera video output, recorded memory contents are destroyed, new camera video is recorded in memory) (Blinking: set to A-EST /EST mode, EST pulse input)
	Not lit	Power OFF or starting up
STATUS	Green	Normal operation
	Red	Fail state (Abnormal power voltage detected)
	Red (Blinking)	Fail state: Sensor temperature rise detection. (Slow Blinking = Caution, Blinking = Danger)
	Not lit	Power OFF or starting up
ETHER	Orange (Blinking)	Network communicating at 1000BASE-T Blinking in ACT status.
	Green (Blinking)	Network communicating at 100BASE-TX Blinking in ACT status.
	Not lit	No network connection or Power OFF
BATT	Green	Memory backup, DC input, battery (charge:maximum)
	Blinking green	Memory backup, battery only (charge:maximum)
	Orange	Memory backup, DC input, battery (charg:medium)
	Blinking orange	Memory backup, battery only (charg:medium)
	Red	Memory backup, DC input, battery (charge:low)
	Blinking red	Memory backup, battery only (charge:low)
	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.
- The battery charge level, is not an accurate indication because it is affected by individual battery differences and environmental temperatures.
  Use it as a guide.
- If the blinking LED changes from orange to red during battery memory backup, recharge the battery immediately.
- In the event of a thermal shutdown, turn off the power to the camera. After a short period of time, turn the camera back on.

■ AC POWER SYSTEM External Appearance and Names

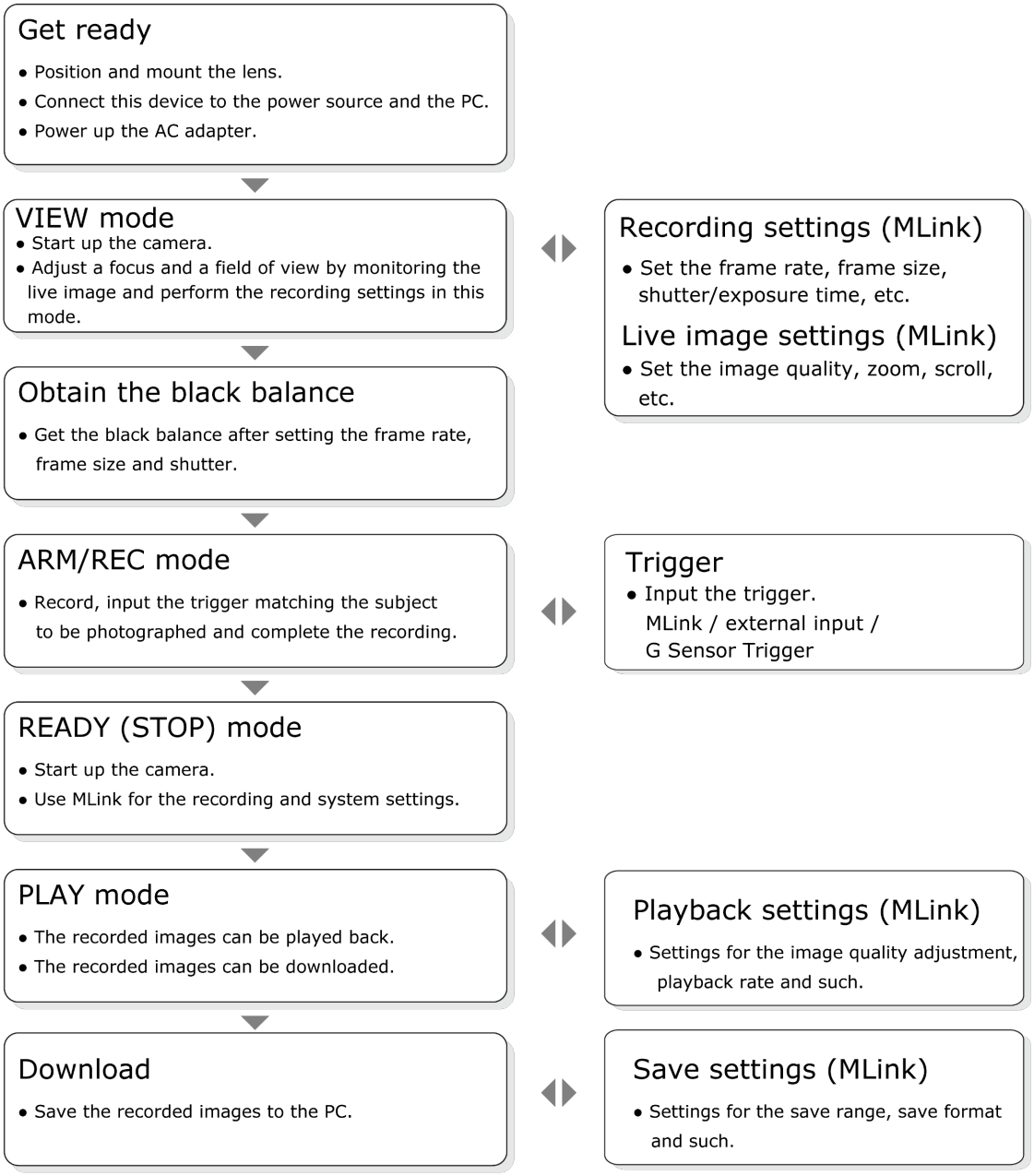




1 AC adapter
2 DC connector
3 Power switch
4 LED
5 AC cable

Flow of Operations

Q2m is operated with the Windows control software MLink.



2

Preparations

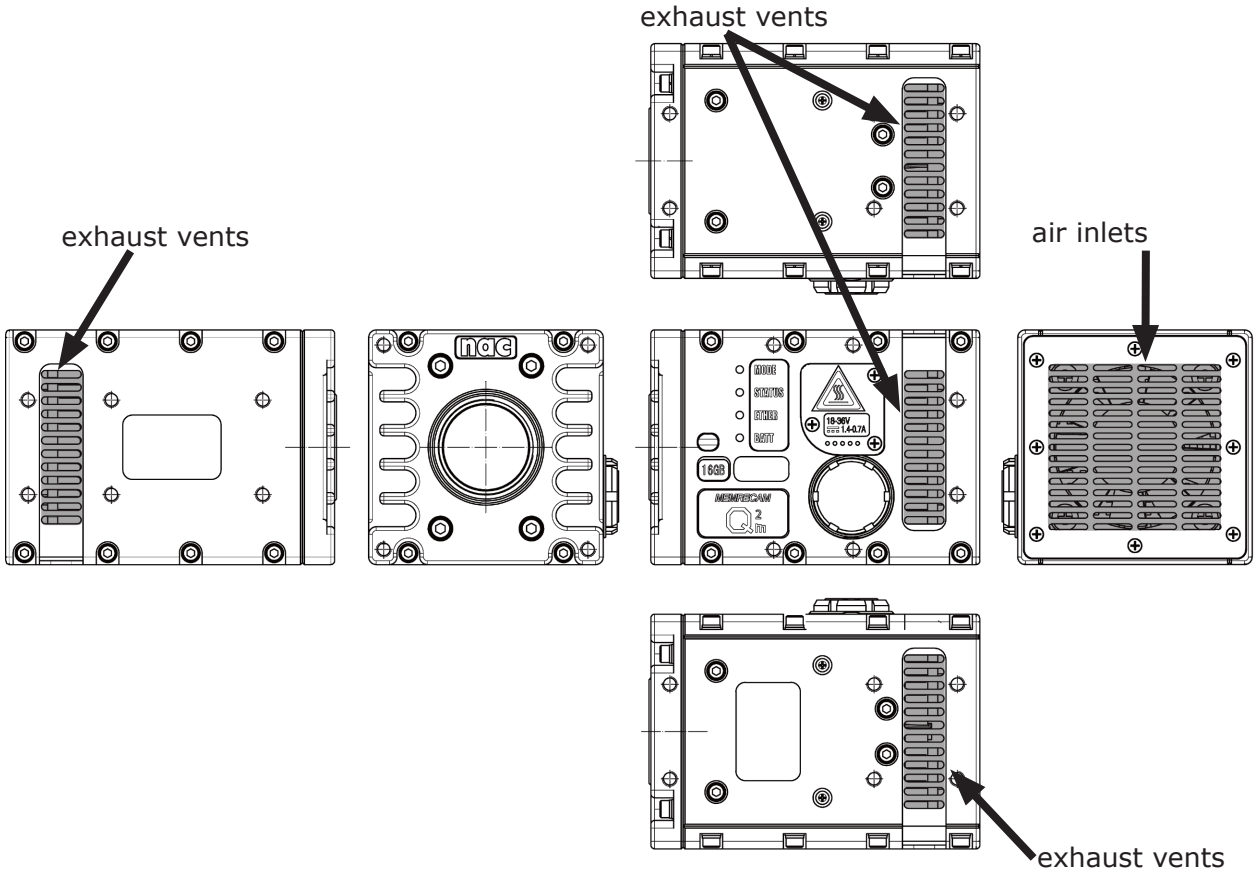
Set Up this Unit

This describes the method of setting up for filming with the MEMRECAM Q2m.

■ Mounting the Camera

Attention

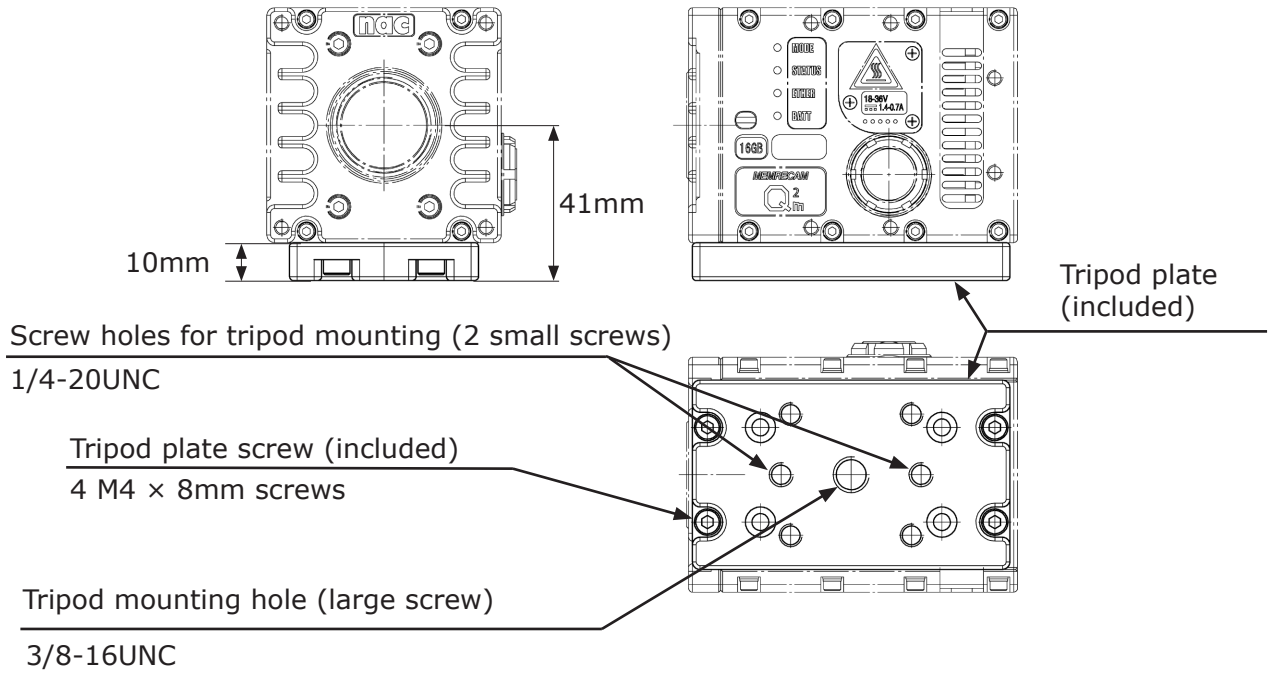
- There are air inlets and exhaust vents on this device for cooling, and ventilation occurs with a fan.
- Install with adequate distance from walls and such so ventilation is not obstructed. Install in a well ventilated location if possible.
- Do not block the air inlets or exhaust vents with objects or cloth.
- The exhaust vent can be used by blocking one place when attaching a tripod plate, etc.



Arrows indicate air inlets and exhaust vents

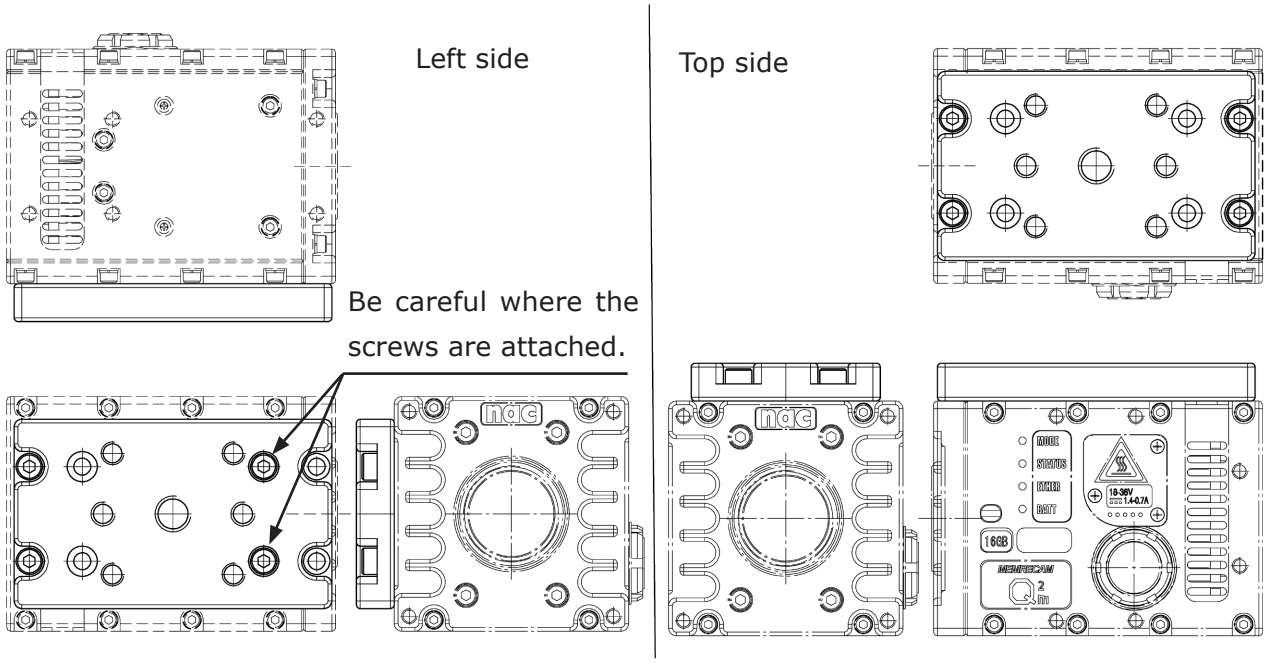
■ Mounting on a Tripod

When attaching the camera to a tripod, attach the included tripod plate to the camera.
The thickness of the tripod plate is 10 mm.
It can be mounted on tripods with mounting screws of 3/8-16UNC or 1/4-20UNC and less than 9mm in length.



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

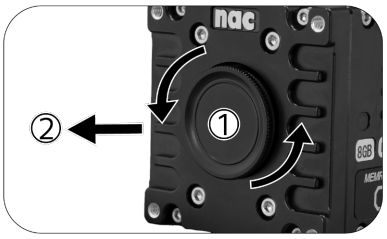
The tripod plate can be attached to the left side and the top.



Mount the Lens

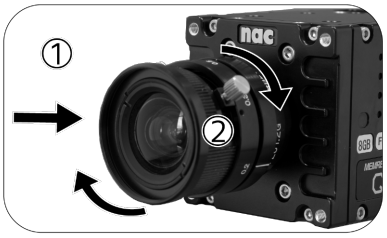
This describes how to mount and remove the C mount lens.

■ Mount the Lens



1 Remove the mount cap

- Remove the Q2m 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.
- Mechanical vignetting may occur with some lenses depending on the image resolution.

- When the camera is not in use, always use the mount cap to keep closing the mount opening. Please do not leave it as is. Please take care not to get any dust or dirt inside the mount.

■ Remove the Lens

1 Remove the lens

- Turn the lens (1) in the direction of the arrows to remove (2) .

Connect the Equipment and Cables

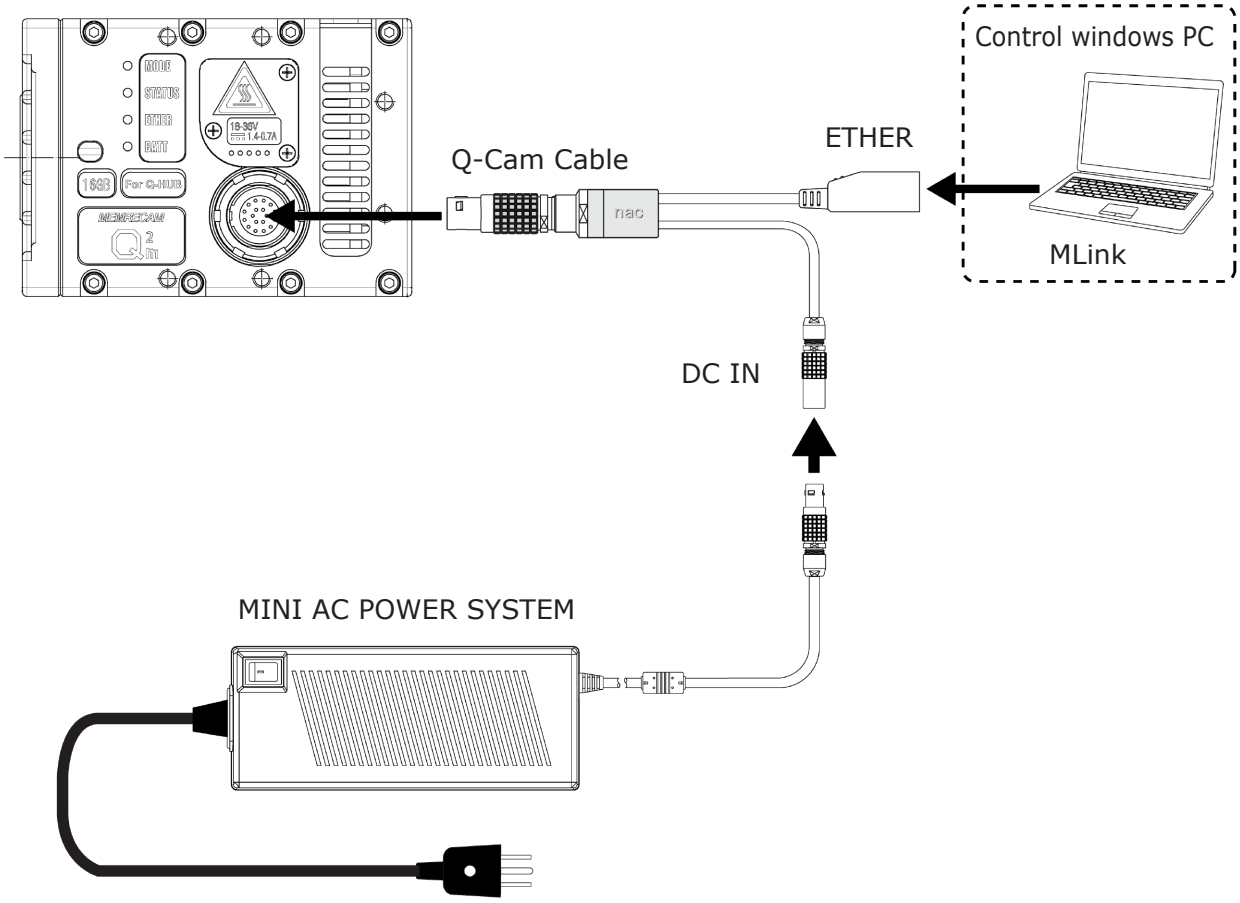
This describes the connections for peripherals for recording such as the power as well as the cables.

■ 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) 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.

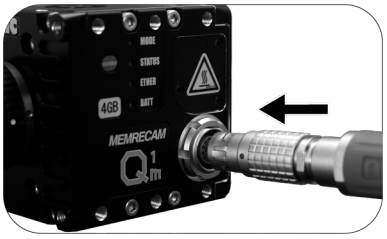
■ Connection Drawing



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

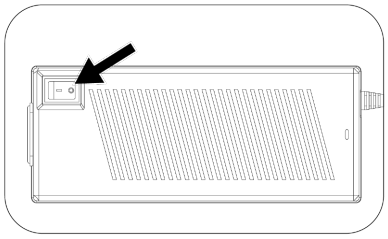
- Mount the locking clip to prevent removal of the cable.

Attention

- Make sure to install the locking clip when using in in a shock or vibration environment.
- The Q-Cam cable is a dedicated cable for Q2m/Q1 and Q5. Do not use with the MEMRECAM GX or HX series.
- Do not connect a cable other than the dedicated cable (Q-Cam cable or Q-HUB remote cable).
  It may cause damage to the camera.

■ Connect the Power

Connect the MINI AC POWER SYSTEM sold separately.

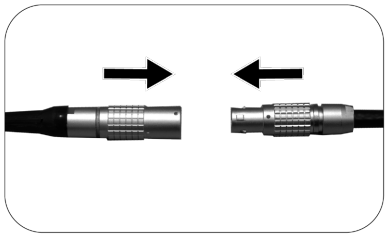


1 Turn the power switch OFF

- Turn the AC adapter power switch OFF.

2 Connect the AC cable to the AC adapter

3 Connect the AC cable to the outlet



4 Connect the DC cable to the Q-Cam cable

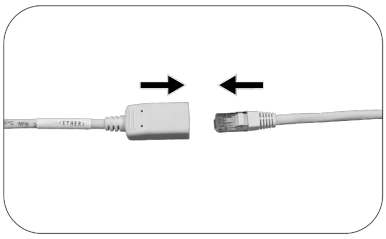
- Line up the red arrow of the AC adapter DC plug with the DC IN connector on the Q-Cam cable and plug in until it clicks.
- When unplugging the DC plug, hold the grip of the plug and pull straight out.

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 Q2m 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.

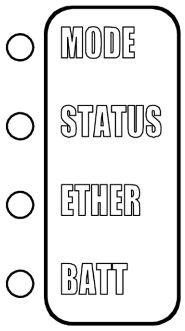
Attention
- The Q2m is designed according to 1000BASE-T communication standards. If remote communication standards (100BASE-TX and such) are used, there will be a reduction in the updating rate.
- Use a category 5e (CAT5e) cable or greater for the Ethernet cable.
- MEMRECAM Q2m is not supported by DHCP (⏭🕮 3-3).

Status LED

Confirmation of the MEMRECAMC Q2m 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 (Blinking)	REC mode (Blinking: set to A-EST / EST mode, EST pulse input)
	Blue	STOP / READY mode
	White (Blinking)	VIEW mode (Blinking: set to A-EST /EST mode, EST pulse input)
	Magenta (Blinking)	ARM mode (camera video output, recorded memory contents are destroyed, new camera video is recorded in memory) (Blinking: set to A-EST /EST mode, EST pulse input)
	Not lit	Power OFF or starting up
STATUS	Green	Normal operation
	Red	Fail state (Abnormal power voltage detected)
	Red (Blinking)	Fail state: Sensor temperature rise detection. (Slow Blinking = Caution, Blinking = Danger)
	Not lit	Power OFF or starting up
ETHER	Orange (Blinking)	Network communicating at 1000BASE-T Blinking in ACT status.
	Green (Blinking)	Network communicating at 100BASE-TX Blinking in ACT status.
	Not lit	No network connection or Power OFF
BATT	Green	Memory backup, DC input, battery (charge:maximum)
	Blinking green	Memory backup, battery only (charge:maximum)
	Orange	Memory backup, DC input, battery (charg:medium)
	Blinking orange	Memory backup, battery only (charg:medium)
	Red	Memory backup, DC input, battery (charge:low)
	Blinking red	Memory backup, battery only (charge:low)
	Not lit	Memory backup is OFF (no recorded data)
	Alternating red and green	Thermal shutdown started

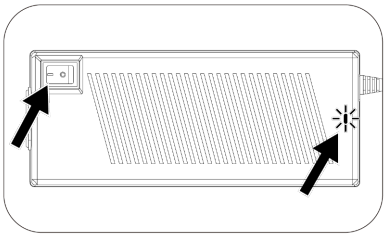
Attention

- 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

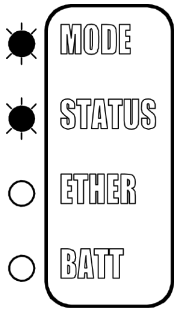
Turn the power on to start up the MEMRECAM Q2m.

■ Start up the Q2m



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.

■ Before turning off the power.

Check the following items before turning off the Q2m.

(1) Did the download of necessary data finish?

The memory backup function is short-lived. If the battery is low, the memory data will be lost.

→ Save the image (⏭🕮3-30)

(2) Did it erase the memory in the camera?

For security reasons, we recommend saving the data in the camera and erasing the memory.

→ All memory clear (⏭🕮3-39)

(3) Is the BATT on the status LED off?

Memory backup is turned off to save battery power.

It will also reduce the battery charge time for the next test (and increase battery life).

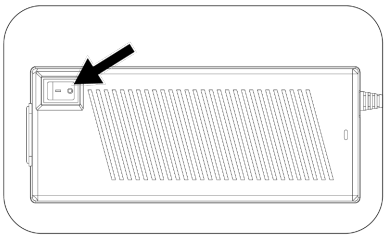
(This also extends battery life.)

→ All memory clear (⏭🕮3-39)

■ Turn Off the Q2m Power

1 Disconnect the MLink and camera with the Windows PC

- Make sure to save the recorded image and setting before disconnecting.
- Disconnect the MLink and Q2m.



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 "MLink User's Manual" for the storage method.

3

Basic Operations

(00477)B

About MLink

Attention
- Q2m works with MLink. It does not work with our HXLink and others.
- For information on how to install the software, please refer to the MLink user's manual.
- The same method can be used to set Q1m/Q1v and Q5. For the GX, MX, HX and ACS series, see the instruction manual for each camera. please.
- MLink, GenICam, and GigE Vision Filter Driver must be properly installed.
  However, if another company's GigE Vision Filter Driver etc. is installed, it may not operate properly.

■ Control Software MLink Operating Environment

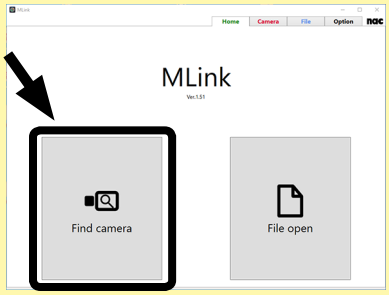
OS	Windows 7 Ultimate / Professional (32/64bit) Windows 8 / 8.1 Pro (32/64bit) Windows 10 Pro (32/64bit) (Only the latest Windows 10 update will be tested) .NET Framework 4.7.1 or later
Memory	8GB or more [16GB or more recommended]
Display	Full color 1024 x 768 or more [1920 x 1080 or more recommended]
HDD	2GB or more for programming and logging 250 GB or more for data (2 TB or more recommended) (depending on the number of cameras and the number of frames to be stored)
Network	Gigabit Ethernet (LAN cable category 5e or higher)
Optical drive	1 optical drive (DVD drive, for installation)

Setting the IP Address

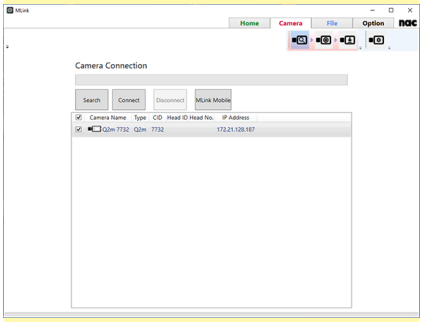
The Q2m does not automatically get the IP addressed using the DHCP server.
Please set the IP address according to the network environment used.

Check the IP Address Setting

The IP address can be checked with MLink if the Q2m is connected to the network used.



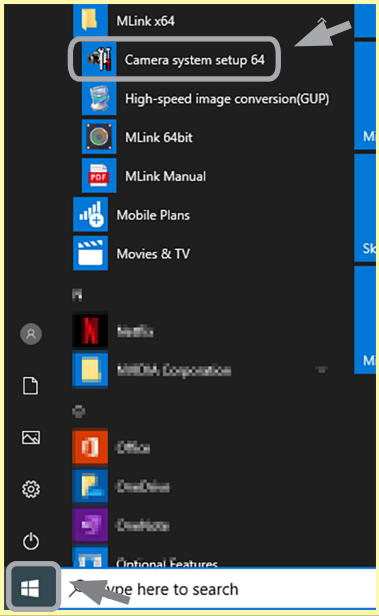
1 With Q2m powered on, click "Find Camera" on MLink.
•Or “Camera” > “Search”.



2 Check the IP address from the list
•Check the IP address shown on the list for the connected Q2m.

Attention
- Connection to the MLink is not possible if the Q2m network is not properly set, and an error will be displayed.

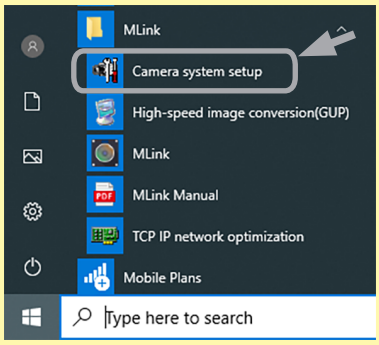
Setting the IP Address



1 Execute the HXUtility

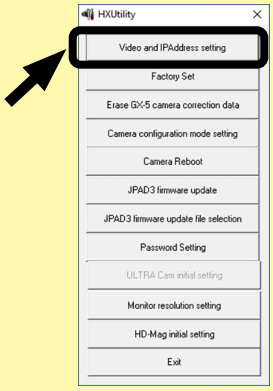
•The figure shows where “Camera system setup 64” is on the start menu with the Windows 10 64bit environment.

• Click “Camera system setup 64” to execute.



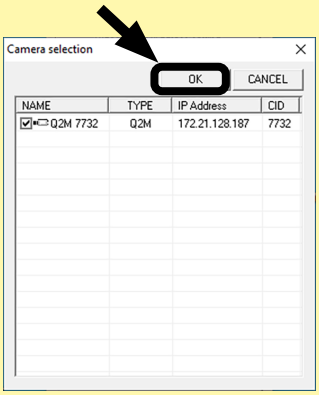
•The figure shows where “Camera system setup” is on the start menu with the Windows 10 32bit environment.

• Click “Camera system setup ” to execute.



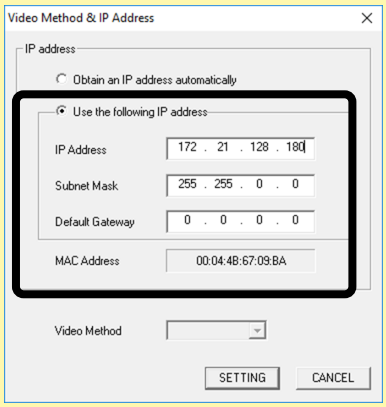
2 Press “Video Method, IP Address Settings” in the HXUtility

• Press “Video Method, IP Address Settings” in the menu.



3 Select the Q2m to be changed from the list

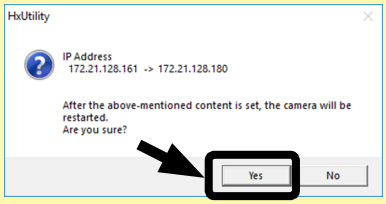
•The Q2m with settings that can be changed will be shown on the list so select one and press "OK".



4 Input the IP address to be set

•Set the IP address, sub net mask and such to match the environment used.

•After finishing the inputs, press "SETTING".



5 Check the details of the settings to be changed

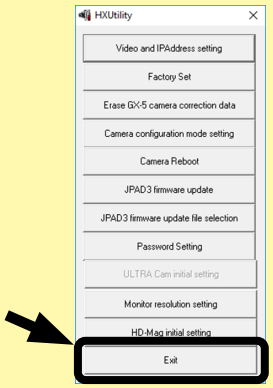
•The left side of the display will be "before the changes" and the right side will the "after the changes".

•If there are no errors to the settings, press "Yes". To correct, press "No" to re-turn to the settings screen.

•The Q2m shuts down automatically.

6 After completing the setting, turn off the AC adapter.

•Turn off the power switch of the AC adapter.



7 End the HXUtility

•Press "Exit" to end the HXUtility.

8 The changed IP address becomes effective after Q2m is re-booted.

•Turn on the power switch of the AC adapter.

•After starting up the Q2m, the new IP ad-dress can be used.

ATTENTION

•After performing this procedure, it is necessary to change the IP address of the control PC in advance so that it can be connected with the IP address after Q2m change. The changeable IP address of the control PC depends on the setting of the IP address of Q2m.

•For example, when setting the IP address of PC to other than 172.21.80.1, set the IP address of PC and the IP address of Q2m not to be the same. At this time, communication can not be performed unless the IP address on the same LAN is set to PC and Q2m. In the case of the example, please set the IP address of PC and Q2m on 172.21. *. *.

Using MLink

A special application is required to operate the Q2m. This describes the basic operations to use MLink.

CHECK •Refer to the MLink user's guide for the method of installing MLink and details on its use.

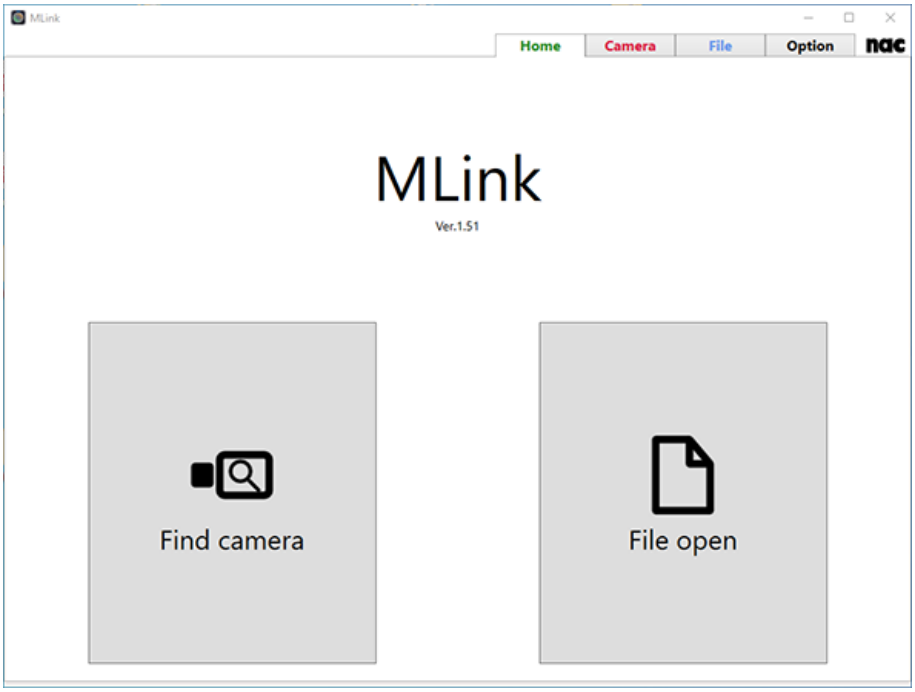
■ Start MLink

Start MLink by double clicking on the shortcut icon on the desktop or on MLinkMainWindow.exe in the installation folder.

MLink (32bit version) icon MLink (64bit version) icon

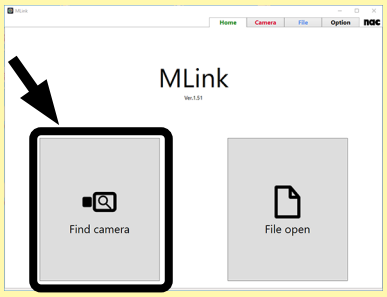
ATTENTION •If installing to a 64bit OS, be careful because the installation destination differs between the 32bit version and the 64bit version.

32bit version C:\Program Files (x86)\nac\MLink
64bit version C:\Program Files\nac\MEMRECAM\MLink



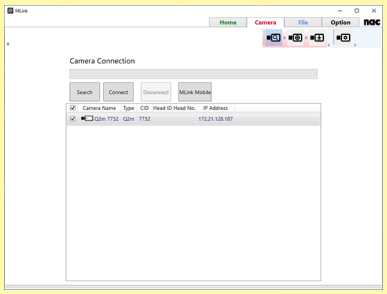
Main Window during MLink Startup

■Connect to the Q2m



1 Press “Find Camera” in the main window

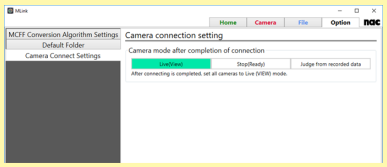
•Press “Find Camera” in the main window



2 Select the Q2m from the list to connect

•Since the Q2m with settings that can be changed are shown on the list, make the selec-tion and press “Connect”.

•When two or more cameras are connected to the Q2m, that camera is also displayed.



3 Operation after MLink connection can be set as optional

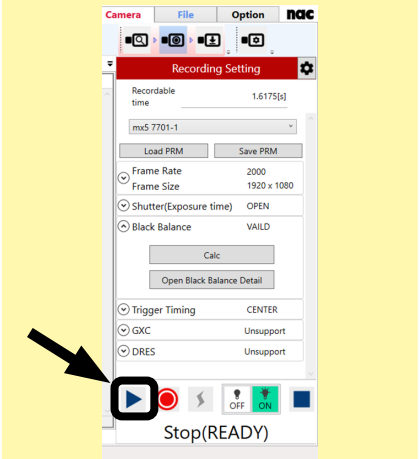
•By default, after connecting to MLink, Q2m automatically goes into live (VIEW) mode.

•It is possible to change the operation setting of Q2m when connecting with MLink option setting.

Display Live Images (VIEW Mode)

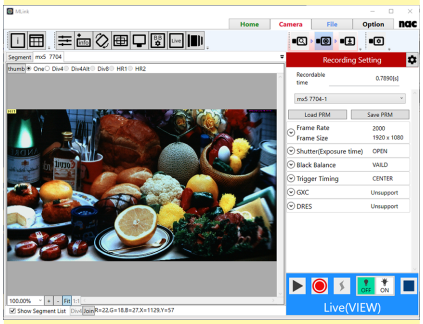
Display live images in the VIEW mode for the recording settings or to adjust the camera and lens.

■ Switch to the VIEW Mode



1 Press the VIEW button

- Switch to the VIEW mode from the STOP mode.



2 Transition to the VIEW mode

- The status LED MODE on the Q2m will be lit in white.

■ Using the Low Light Function

There may be times when a bright and clear live image cannot be obtained with the set frame rate. If the low light function is used, an image brighter than the image filmed using the set frame rate is shown, so the angle of view and focus can be easily verified.

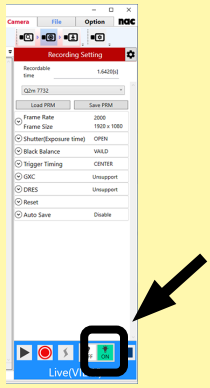
ATTENTION

- The low light function is only effective for displaying images in the VIEW mode. Image display during the ARM mode or the REC mode, as well as photographing images actually recorded is not possible.
- The low light function is used to keep the aperture of the lens in place. Do not use the low light function to move the lens aperture. Do not move the lens aperture when using the low light function, as this may result in a failed record.

■Enable the Low Light Function

1 Access the VIEW mode

•Switch to the VIEW mode.

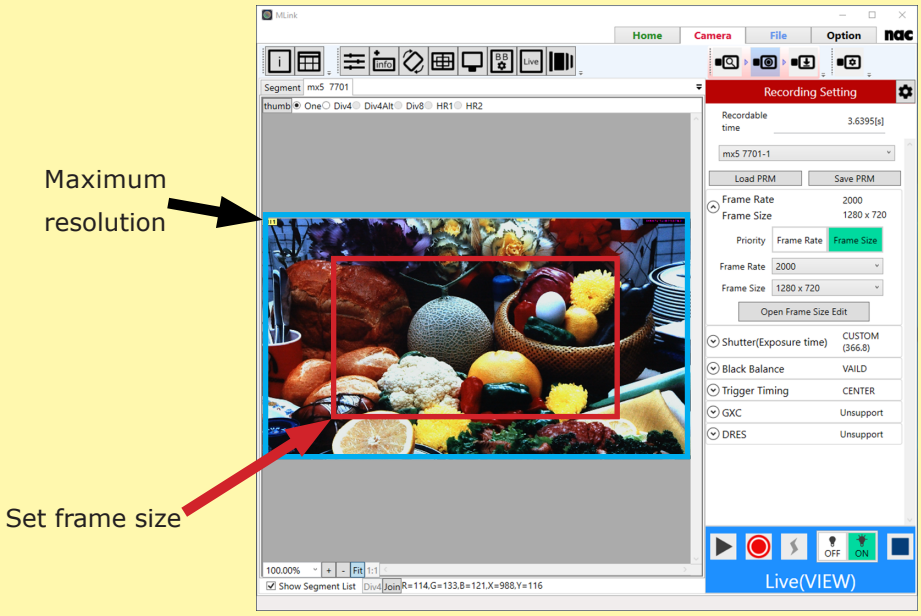


2 Turn the low light function ON.

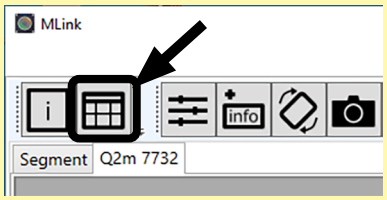
•Click ON.

3 Display in low light mode

•In the low light mode, the maximum resolution of the camera is also displayed, and the red frame becomes the frame size set (For the illustration, a frame has been added).



■ Selects the brightness (exposure time) when the low light function is enabled.

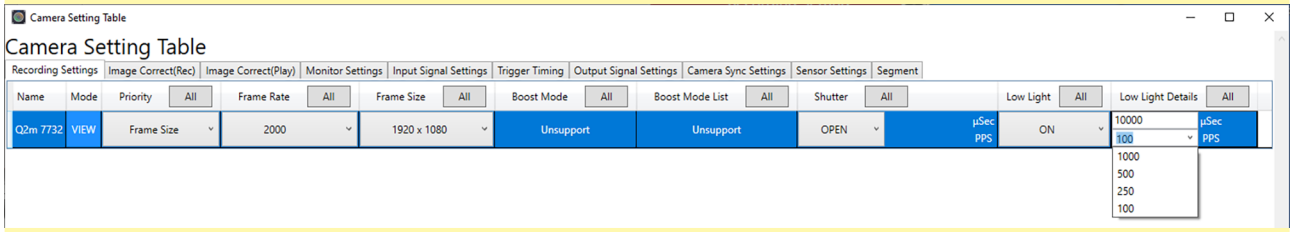


1 Displaying the Camera Setting Table

•Click on the Camera Setting Table in the Camera Quick Toolbar.

2 Set in Low Light Details

•Enter the exposure time in "Low Light Details" or select it from the pull-down menu.



Pull-down menu	
1000	Displays the live image at an exposure time of 1/1000 sec (corresponds to a frame rate of 1000 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)
250	Displays the live image at an exposure time of 1/250 sec (corresponds to a frame rate of 250 frames/sec, OPEN shutter)
100	Displays the live image at an exposure time of 1/100 sec (corresponds to a frame rate of 100 frames/sec, OPEN shutter)

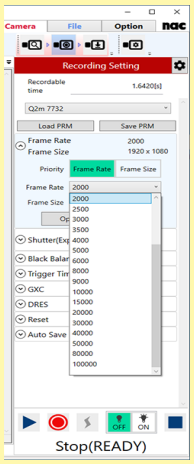
Basic Recording Settings

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

■ Select the Frame Rate

1 Switch to the STOP/VIEW mode

2 Select the frame rate

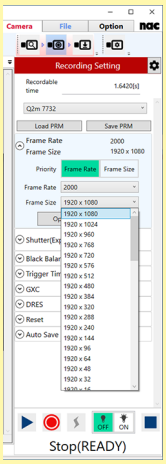


•The frame size is limited by the frame rate. If the frame rate is increased, the frame size is changed accordingly.

ATTENTION •If using black balance, redo the black balance after changing the frame rate.

■Select the Frame Size

1 Switch to the STOP/VIEW mode



2 Select the frame size

•The frame size is limited by the frame rate. If the frame rate is increased, the frame size is changed accordingly.

ATTENTION •If using black balance, redo the black balance after changing the frame size.

■ Preset table of frame rate and frame size (1/3)

Frame Rate (fps)	Frame size						
	128×8 640×8 1280×8 1920×8	128×16 640×16 1280×16 1920×16	128×32 640×32 1280×32 1920×32	128×48 640×48 1280×48 1920×48	128×64 640×64 1280×64 1920×64	128×96 640×96 1280×96 1920×96	192×144 640×144 1280×144 1920×144
50	√	√	√	√	√	√	√
60	√	√	√	√	√	√	√
100	√	√	√	√	√	√	√
250	√	√	√	√	√	√	√
500	√	√	√	√	√	√	√
1,000	√	√	√	√	√	√	√
2,000	√	√	√	√	√	√	√
2,500	√	√	√	√	√	√	√
3,000	√	√	√	√	√	√	√
3,500	√	√	√	√	√	√	√
4,000	√	√	√	√	√	√	√
5,000	√	√	√	√	√	√	√
6,000	√	√	√	√	√	√	√
8,000	√	√	√	√	√	√	√
9,000	√	√	√	√	√	√	√
10,000	√	√	√	√	√	√	√
15,000	√	√	√	√	√	√	√
20,000	√	√	√	√	√	√	
30,000	√	√	√	√	√		
40,000	√	√	√	√			
50,000	√	√	√				
80,000	√	√					
100,000	√						

■ Preset table of frame rate and frame size (2/3)

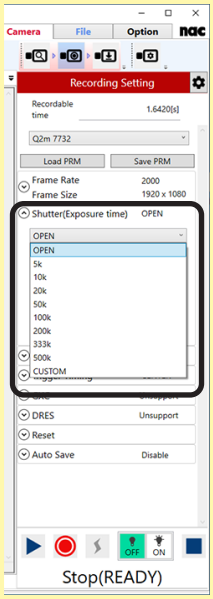
Frame Rate (fps)	Frame size						
	320×240 640×240 1280×240 1920×240	384×288 640×288 1280×288 1920×288	640×320 1280×320 1920×320	512×384 640×384 1280×384 1920×384	640×480 1280×480 1920×480	768×512 1280×512 1920×512	768×576 1280×576 1920×576
50	√	√	√	√	√	√	√
60	√	√	√	√	√	√	√
100	√	√	√	√	√	√	√
250	√	√	√	√	√	√	√
500	√	√	√	√	√	√	√
1,000	√	√	√	√	√	√	√
2,000	√	√	√	√	√	√	√
2,500	√	√	√	√	√	√	√
3,000	√	√	√	√	√	√	√
3,500	√	√	√	√	√	√	√
4,000	√	√	√	√	√	√	√
5,000	√	√	√	√	√	√	
6,000	√	√	√	√			
8,000	√	√	√				
9,000	√	√					
10,000	√						
15,000							
20,000							
30,000							
40,000							
50,000							
80,000							
100,000							

■ Preset table of frame rate and frame size (3/3)

Frame Rate (fps)	Frame size				
	1280×720 1920×720	1024×768 1280×768 1920×768	1280×960 1920×960	1280×1024 1536×1024 1920×1024	1920×1080
50	√	√	√	√	√
60	√	√	√	√	√
100	√	√	√	√	√
250	√	√	√	√	√
500	√	√	√	√	√
1,000	√	√	√	√	√
2,000	√	√	√	√	√
2,500	√	√	√	√	
3,000	√	√			
3,500	√				
4,000					
5,000					
6,000					
8,000					
9,000					
10,000					
15,000					
20,000					
30,000					
40,000					
50,000					
80,000					
100,000					

■Select the Shutter Speed

1 Switch to the STOP/VIEW mode



2 Select the shutter speed

•Use the slider for the shutter speeds that can be set on the camera or numerically input in micro-second units.

(Example) Shutter Speeds and Exposure Times

OPEN	1/frame rate (sec)
1k	1/1000
2k	1/2,000
5k	1/5,000
10k	1/10,000
20k	1/20,000
50k	1/50,000
100k	1/100,000
200k	1/200,000
33k	1/333,333
500k	1/500,000

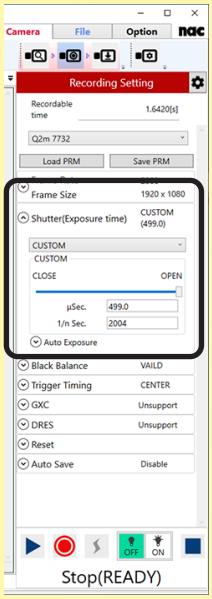
CHECK •The exposure time cannot be set to longer than 1/frame rate.

•If using black balance, redo the black balance after changing the shutter speed.

Shutter Speeds that can be Selected

Preset Shutter Speeds	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, 1/100,000, 1/200,000, 1/333,333, 1/500,000

■ Customize shutter speed



1 Select the shutter speed

- Select "CUSTOM" from the menu.
- Can select by slider or by numerical input.

ATTENTION

- Depending on the recording speed, the upper and lower limit of the shutter speed are decided.
- When a value exceeding the shutter speed limit is entered, the maximum or minimum value that can be set is set.
- If using black balance, redo the black balance after changing the shutter speed.

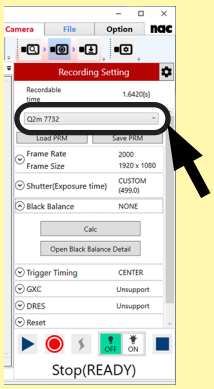
Adjusting the Black Balance

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

CHECK
- The noise and the black level of the image sensor used with the Q2m are changed by the temperature of the sensor and the recording settings. This noise is called fixed pattern noise, and has a pattern that is different for each solid image sensor.
- The Q2m reads the temperature of the image sensor and automatically reduces noise by using individually registered image correction data.
- For higher quality image quality, we recommend adjusting the black balance just before recording.

ATTENTION
- When adjusting the black balance, make sure to put on the lens cap for shading.
- If two or more cameras are connected, adjust the black balance respectively.

■Adjusting the Black Balance

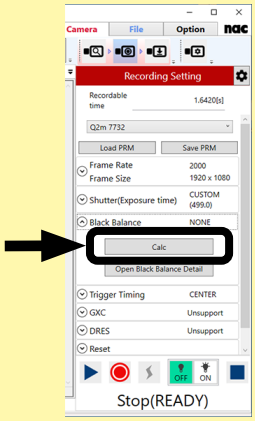


1 Set the “Frame Rate” and “Frame Size” for recording

- Perform the recording settings for recording.
- The Q2m switches to the STOP mode.
- Configure the recording settings for recording.

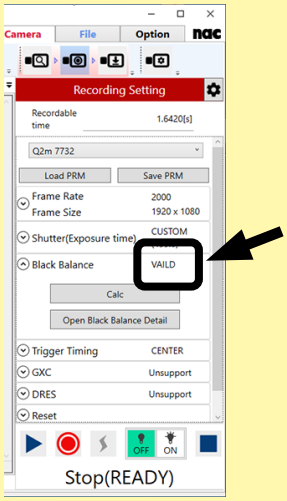
2 Put the lens cap on the lens to cover it

- Make sure light doesn’t get into the lens.



3 Click to "Calc" the black balance

- Click to "Calc" the black balance and get the data required from the sensor.

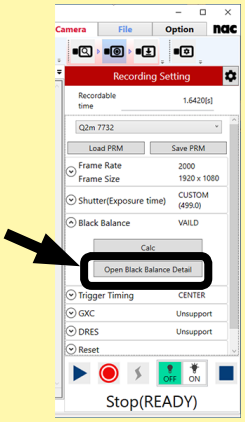


4 End adjustment of the black balance

- Adjusting the black balance is done once it switches from “NONE” to “VAILD”.

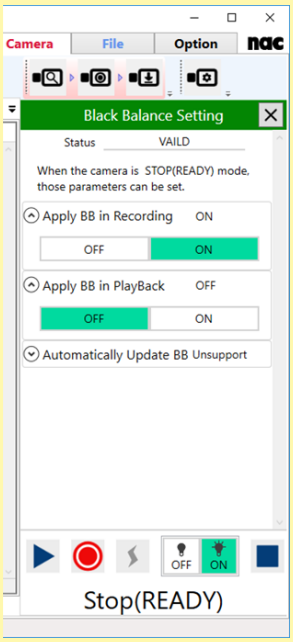
■ Black Balance Details

Settings relating to the application of the black balance.



1 Click on black balance details to open.

•Click "Open Black Balance Detail".



2 Set the black balance details

•Apply BB in Recording

Set whether or not to use the black balance data during ARM.

Setting	Description
OFF	Built-in correction data based on sensor temperature is applied.
ON	Use the calculated black balance data.

•Apply BB in Playback

Set whether or not to use the black balance data during PLAY.

Setting	Description
OFF	Built-in correction data based on sensor temperature is applied.
ON	Use the calculated black balance data.

•Automatically Update BB

Q2m does not support it.

(MEMRECAM HX,ACS series option)

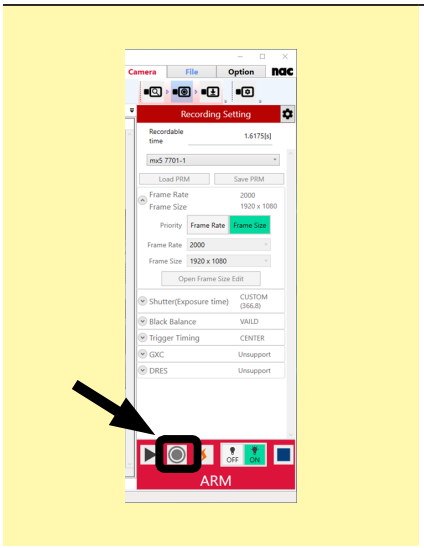
Start Recording (ARM Mode)

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

ATTENTION

- Before switching to the ARM mode, make sure you save any images needed to the memory.
- Switch to the ARM mode and images recorded in the memory will be overwritten and deleted. Switch to the ARM mode only after confirming if the images can be deleted.

■ Switch to the ARM Mode



1 Press the ARM button

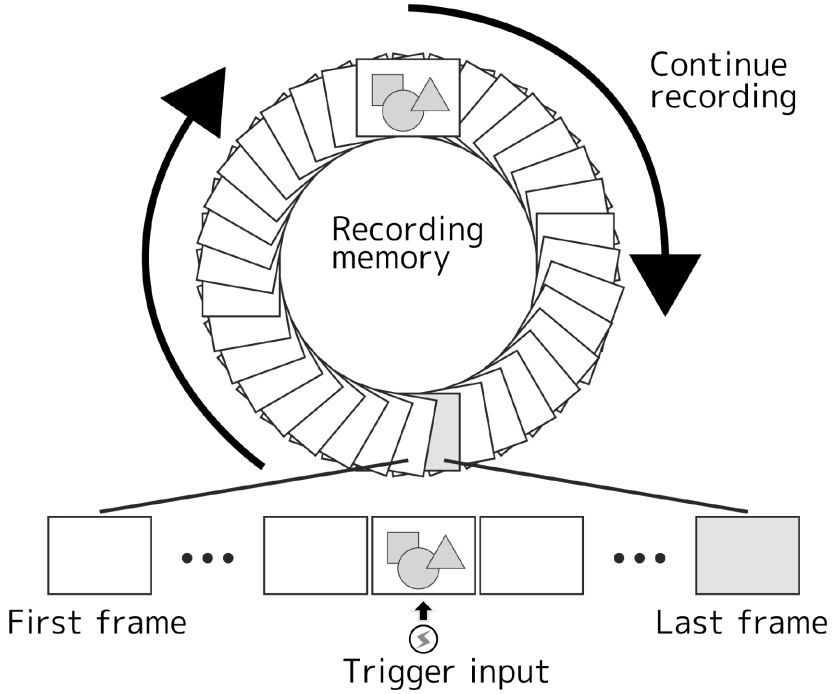
- Switch from the STOP/VIEW mode to the ARM mode.
- In ARM, the recording settings cannot be changed.
- The status LED MODE on the Q2m will be lit in magenta.

ATTENTION

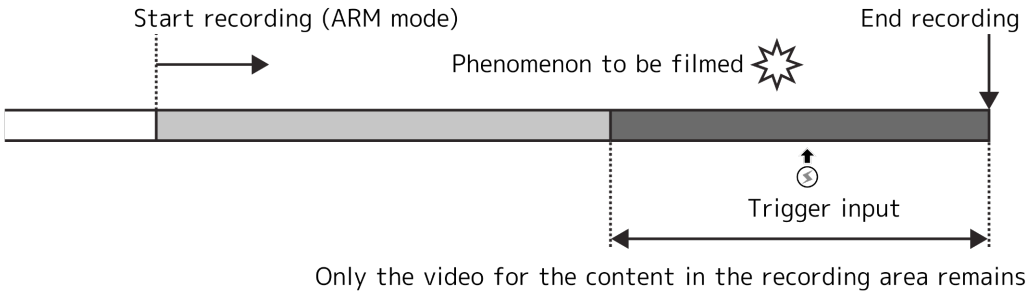
- Recording is not possible when the Q2m status LED STATUS is rapidly blinking red, even if it is in the ARM mode.

Ring Buffer

In the ARM mode, the Q2m 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.



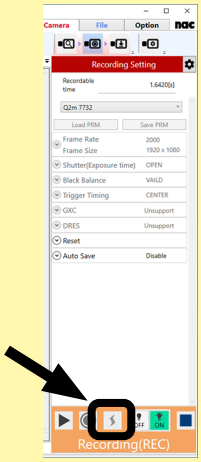
This operation continues until the trigger is input, when the overwrite recording is stopped according to the trigger input and trigger timing settings.



Trigger Input (REC Mode)

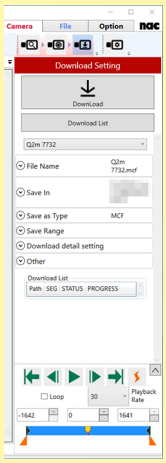
Input the trigger that matches the images to be photographed and then end recording.

■ Input the Trigger



1 Press the trigger button while in the ARM mode

- Switch to the REC mode.
- The status LED MODE on the Q2m will be lit in orange.



2 After completing the recording, switch to the SAVE mode

- Upon completion of recording, it automatically switches to the SAVE mode.

ATTENTION

- There are trigger input methods not on MLink
  Input with external trigger input signals.
  Input with the G sensor trigger.

G Sensor Trigger

There is a G sensor in the Q2m so trigger input is possible via shock.

ATTENTION

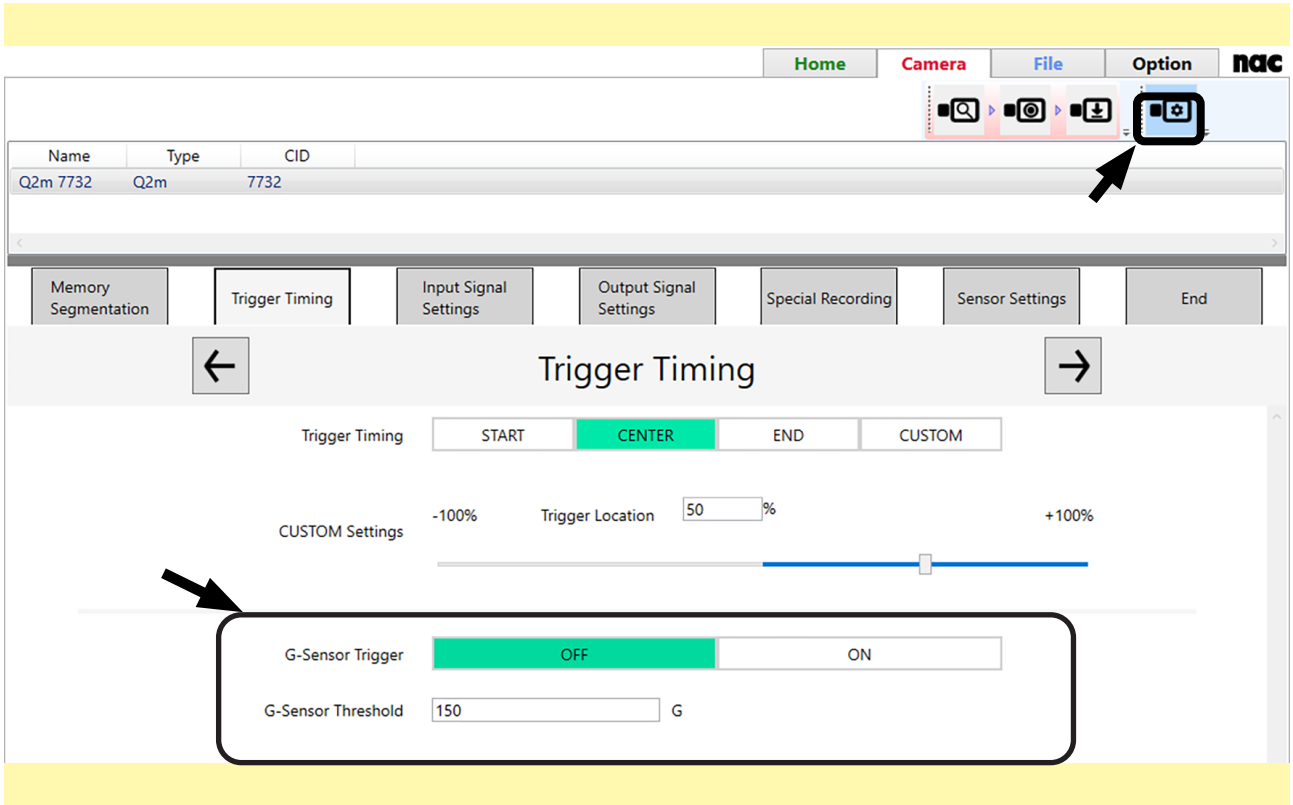
- The bandwidth for G sensor operation is up to 1 kHz.
- The G sensor installed can detect values lower than the actual contact. During use, set the threshold value with a margin of approximately 20%.
  Ex.) In the case of a 150G shock environment→ threshold value 120G
- Depending on the test conditions, there may be times when detection is not possible with the G sensor.

■Set the G Sensor Trigger

Settings are made with MLink

1 G Sensor Trigger settings

- Click on the options and select trigger timing.
- Turn the G Sensor trigger ON to enable.
- The units for the threshold value are G (load acceleration).



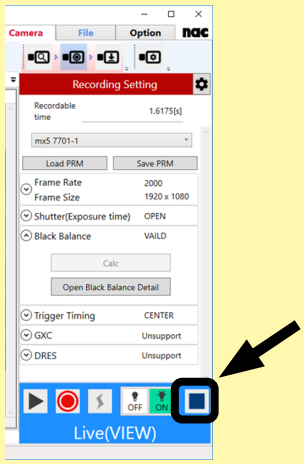
ATTENTION

- Make sure the G sensor trigger is turned OFF when not in use. Shock may cause unintended trigger input.

Stop (STOP Mode)

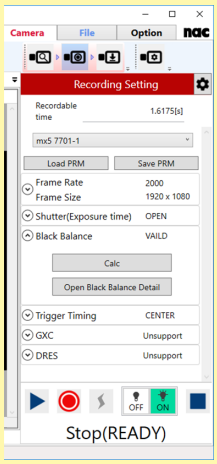
After startup and connection from MLink, the MEMRECAM Q2m enters the VIEW mode.

■ Switch to the STOP Mode



1 Press the STOP button from any mode

- Switch to the STOP mode from any camera mode other than STOP, including VIEW or ARM.
- Switch the Q2m to the STOP mode.



2 Transition to the STOP mode

- The status LED MODE on the Q2m will be lit in blue.

Playback (PLAY Mode)

Plays back the recorded image.

■ Playback

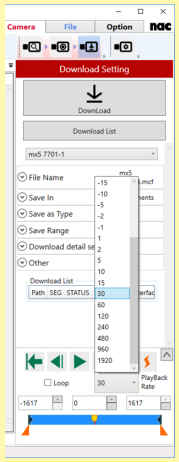
1 Switch to the download settings panel

- After recording is finished, it automatically switches to the panel.
- The status LED MODE on the Q2m will be lit in blue.

Operation Buttons	
	To the start frame Displays the frame for starting playback.
	Back one frame Backs up one frame from the current frame.
	Play Playback.
	Stop Stops the playback.
	Skip one frame Skip one frame from the current frame.
	To the end frame Displays the frame that ends playback.
	Trigger jump Displays the trigger frame from the current frame.

■ Change the Playback Rate

The playback speed can be changed. Can also be set to reverse playback.



1 Select the frame rate on the pulldown menu for playback rate

•The playback Rate that can be set are shown for setting.

List of playback rates that can be Set

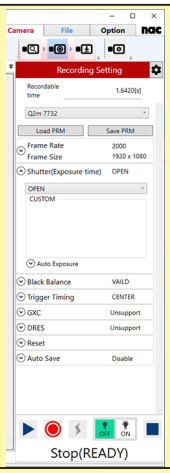
Playback Direction	Playback Rate
Play	1, 2, 5, 10, 15, 30, 60, 120, 240, 480, 960, 1920
Reverse	-1, -2, -5, -10, -15, -30, -60, -120, -240, -480, -960, -1920

Saving Images

Download the recorded video to the HDD or other storage media of the PC.

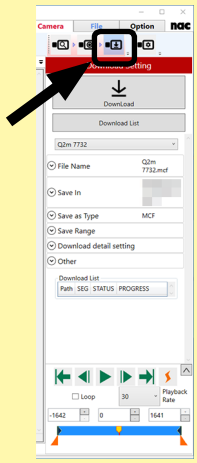
ATTENTION •Do not adjust the black balance before saving data.

■Save the image to the control PC by MLink



1 Switch to the STOP mode

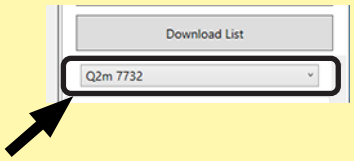
•Switch to the STOP mode.



2 Display the download screen

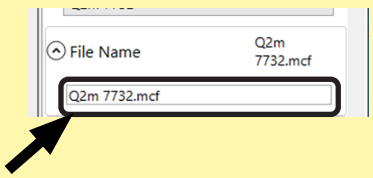
•Click "Download" from the camera task tool bar.

•The status LED MODE on the Q2m will be lit in blue.



3 Set the target camera

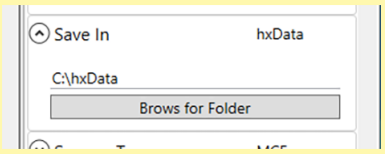
•If connecting multiple cameras, set the Q2m for the data download.



4 Set the save file name

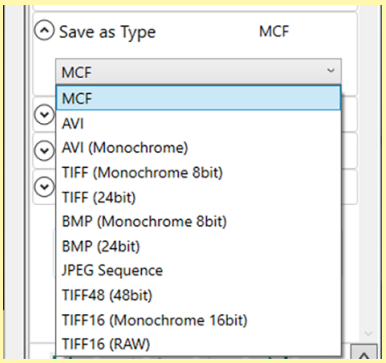
•Set the save file name.

•The default setting is camera name + CID.



5 Set the save destination

•Set the save destination for the file.



6 Set the save format

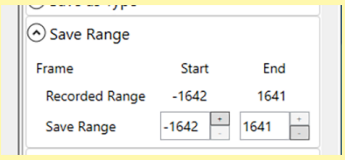
•Set the save format for the file.

Save formats that can be selected

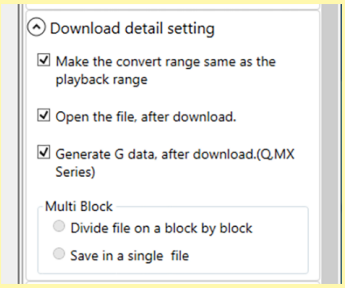
File Format	Extension	File Type	Remarks
MCFF	.mcf	MCFF	MEMRECAM dedicated video file format.
AVI	.avi	Color 24bit AVI	Video
AVI (Monochrome)	.avi	Monochrome 8bit AVI	Video
TIFF (Monochrome 8bit)	.tif	Monochrome 8bit TIFF	Still image
TIFF (24bit)	.tif	Color 24bit TIFF	Still image
BMP (Monochrome 8bit)	.bmp	Monochrome 8bit bitmap	Still image
BMP (24bit)	.bmp	Color 24bit bitmap	Still image
Jpeg Sequence	.jpg	Color 24bit JPEG	Still image
TIFF48 (48bit)	.tif	Color 48bit TIFF	Still image
TIFF16 (Monochrome 16bit)	.tif	Monochrome 16bit TIFF	Still image
TIFF16 (RAW)	.tif	Monochrome 16bit TIFF (RAW)	Still image

CHECK
- When TIFF 16 (RAW) is selected, MCFF data not subjected to image quality adjustment is output to 16 bit TIFF.
- Selecting TIFF (Monochrome 8 bit), BMP (Monochrome 8 bit), TIFF 16 (Monochrome 16 bit) will output a monochrome image with 0% chroma.
- TIFF 16 (Monochrome 16 bit), TIFF 48 (48 bit) will output the black level as 128.
- When "Still image" such as TIFF is selected, a folder with the specified file name is created and the still images are saved in the folder as a sequential number.
  The still image file name is a file name with a number appended to it. The number to be added increases every frame with the start frame as 0.

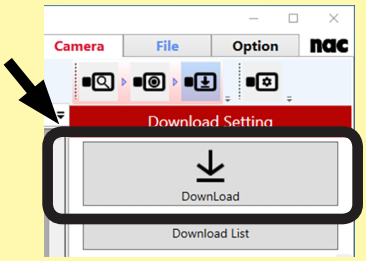
ATTENTION
- MLink can not open TIFF 16 (RAW), TIFF 16 (Monochrome 16 bit), TIFF 48 (48 bit) files. It can be displayed by image editing software such as Adobe Photoshop etc.

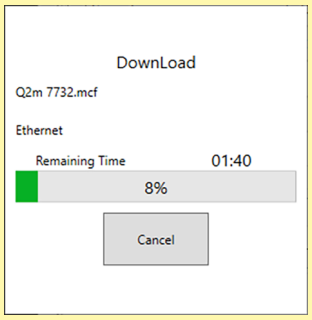


7 Set the save range
- Set the frames and such to be saved.



8 Set download detailed settings
- Set detailed download settings.





9 Start downloading

- Click "Download" to start downloading. Check the progress with the progress bar.
- Click "Cancel" to suspend the download.

10 Switch to playback mode

- When downloading is completed, it shifts to Playback mode.

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.

■LED During Memory Backup Operation

LED	LED Status	Operation
BATT	Green	Memory backup, DC input, battery (charge:maximum)
	Blinking green	Memory backup, battery only (charge:maximum)
	Orange	Memory backup, DC input, battery (charg:medium)
	Blinking orange	Memory backup, battery only (charg:medium)
	Red	Memory backup, DC input, battery (charge:low)
	Blinking red	Memory backup, battery only (charge:low)
	Not lit	Memory backup is OFF (no recorded data)
	Alternating red and green	Thermal shutdown started

ATTENTION

- Since the amount of the charge is influenced by the difference in individual batteries and the ambient temperature, an exact amount is not shown. Use this as a reference.
- If the color of the flashing LED switches from orange to red during memory backup using the battery, charge as soon as possible.
- If a thermal shutdown occurs, turn off the AC adapter and then turn it back on. Turn on the power. If the built-in fan of the Q2m is not working when the power is turned on, it may be a failure. Please contact dealer or us.
  Do not use, as it could be dangerous.

Saving and Loading Settings

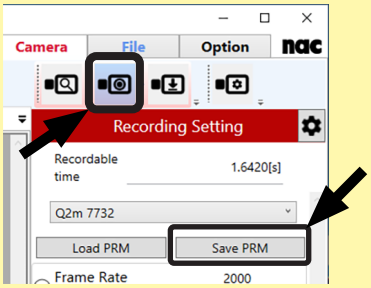
To keep the desired shooting settings, save the settings.

Load the configuration after the next connection.

This section describes how to save and load the camera's settings.

CHECK • PRM is an abbreviation for camera parameter file.

■ Saving the PRM



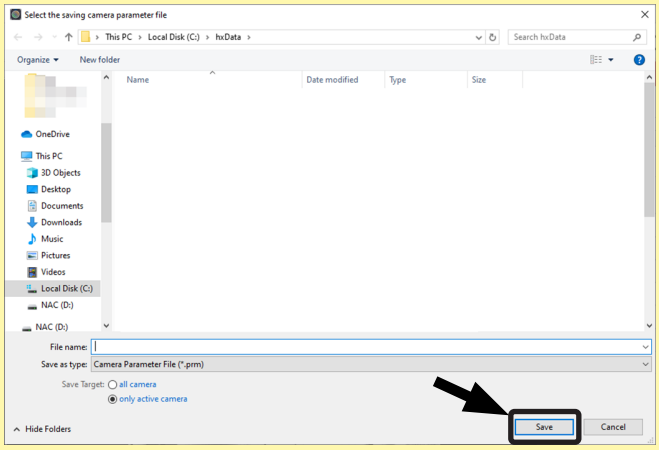
1 Click Save PRM

- Select Recording Setting from the Task Toolbar.
- Click Save PRM.

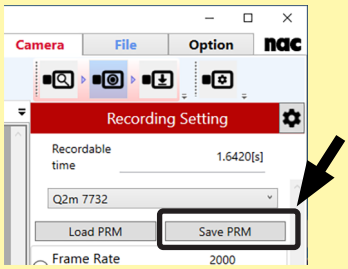
2 Save the PRM

- Specify the file name and save destination and click Save .
- Save Target

Setting	Description.
all camera	Export the recording settings of all connected cameras to a single PRM file.
only active camea	The recording settings of only one active camera are exported to a single PRM file.



■ Loading the PRM



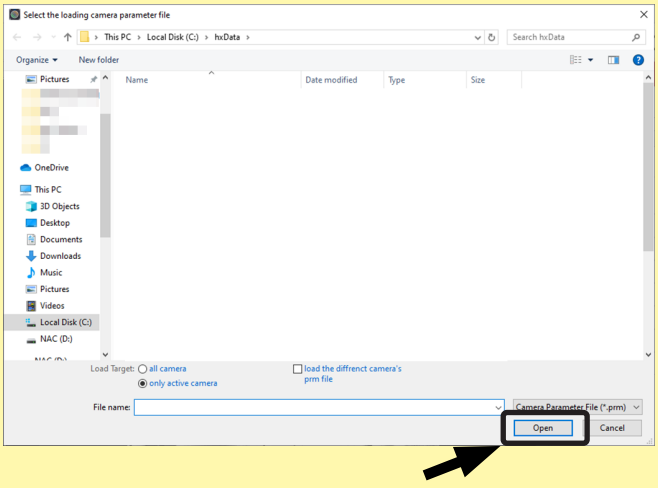
1 Click Save PRM

- Select Recording Setting from the Task Toolbar.
- Click Load PRM.

2 Save the PRM

- Specify the file name and save destination and click Save.
- Load Target

Setting	Description.
all camera	Apply the recording settings to all connected cameras.
only active camea	Only the active cameras have their recording settings applied.
load the differrent camera's prm file	If checked, set the recording settings at the beginning of the PRM file to the active camera. If it is unchecked, set the active camera to the recording settings of the active camera, if the active camera's recording settings are specified in the PRM file.

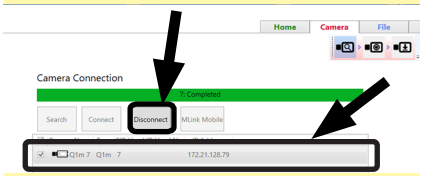


Disconnecting the camera from MLink

Disconnect the MLink from the Q2m

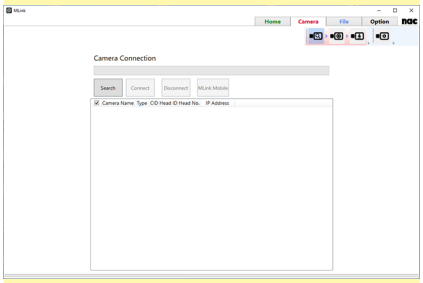
ATTENTION •Download the necessary data.

■ Disconnect



1 Specify Q2m to be disconnected in the item list and click "Disconnect"

•Select Q2m to be disconnected from the list and click "Disconnect".



2 Disconnection is completed

•The disconnected Q2m will be deleted from the list.

•To connect again, click "Search" and execute. Please select the corresponding Q2m from the search result and click "Connect".

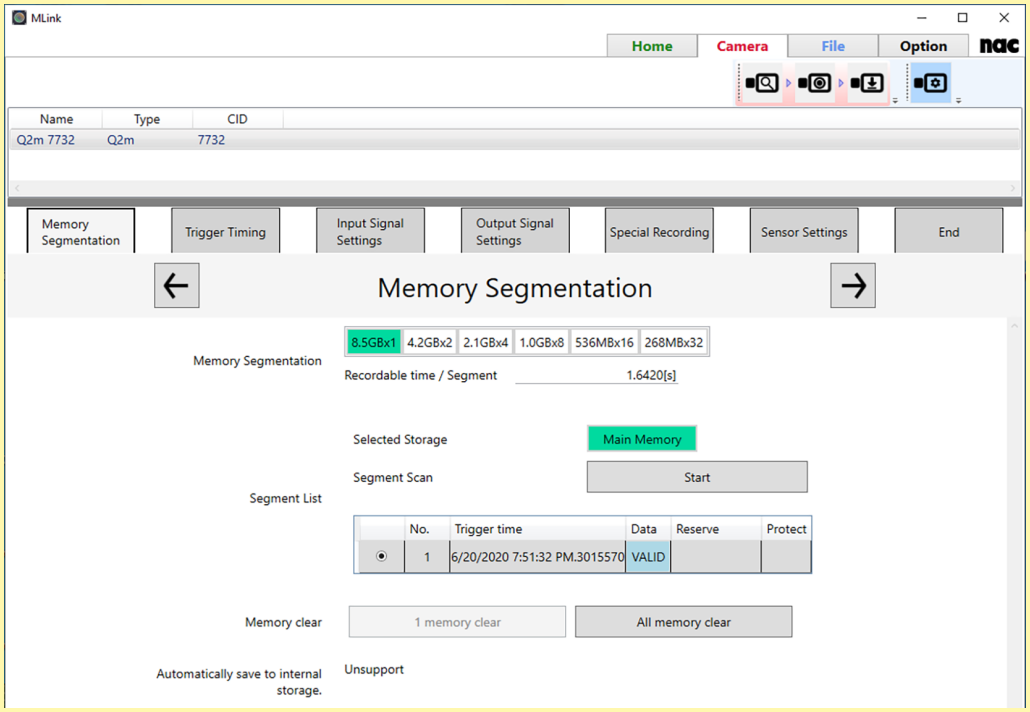
Detailed Settings

■Recording Settings

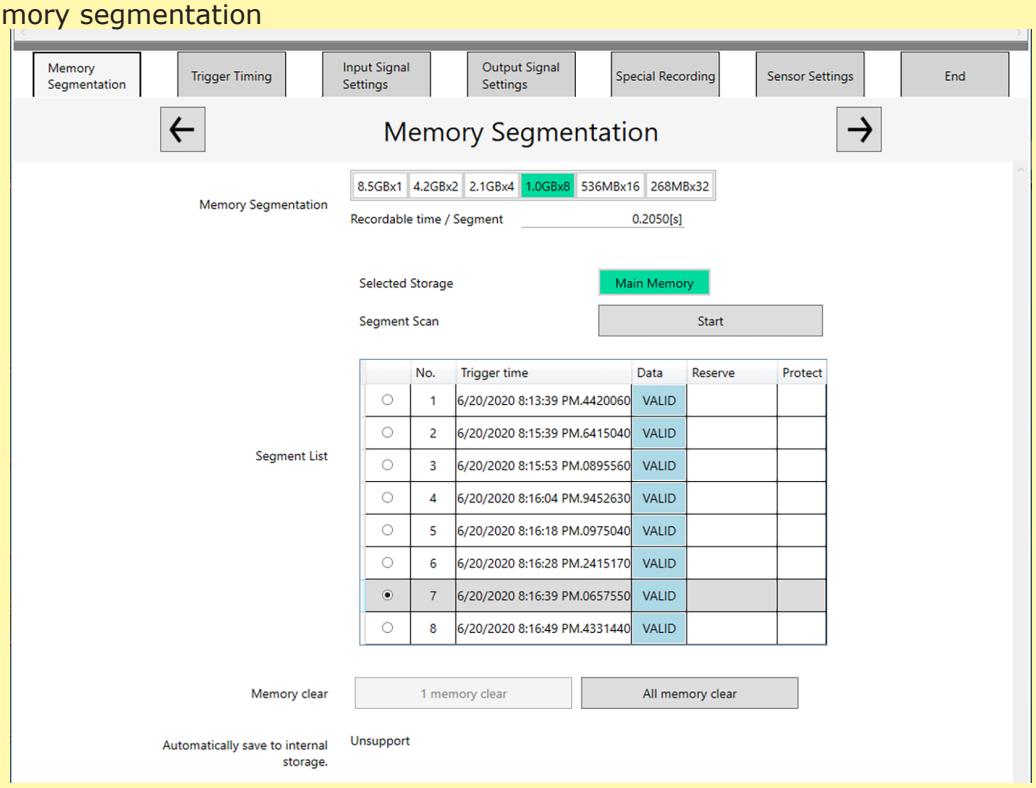
In the Recording menu, the settings are set according to the shooting environment (camera placement, input and output signals to the camera, and recording method). Basically, these settings are retained once set. It is not necessary to change the settings when reconnecting.

•Please refer to (⏭🕮4-23) or later for the specifications regarding input and output of each connector.

■ Memory Segmentation



After Memory segmentation

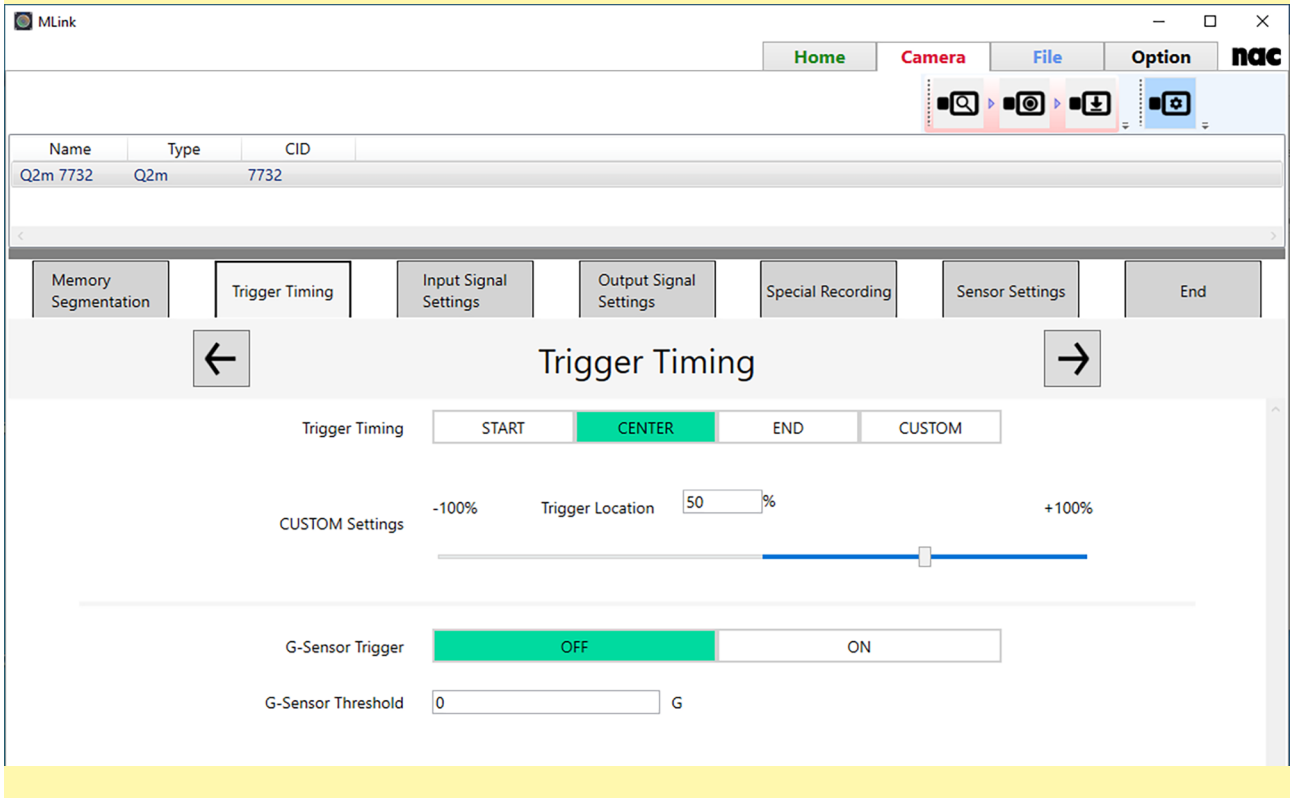


Memory Segmentation	The recording memory of the camera can be divided into segments. The recording time of a segmented memory segment decreases depending on the number of segments, but the recording time of a different scene can be divided into two segments It can be recorded in memory for a few minutes.

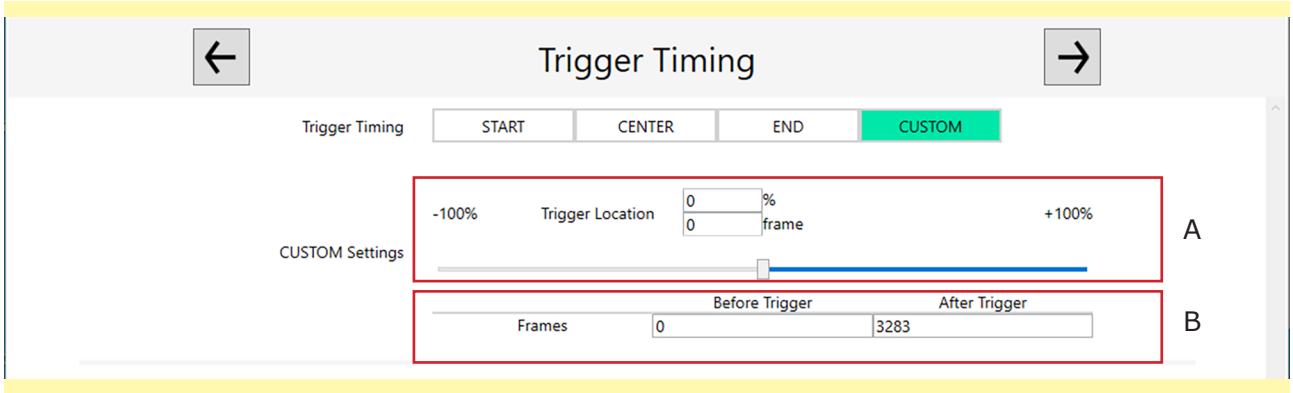
- When segmentation is performed, the image data in the camera's memory will be lost. If the required data remains, be sure to download the image data before segmentation is executed.
- When segmentation is performed, the memory backup function is turned off.

Segment List	Selected Storage	Switches the storage to which the recorded data in the camera is referred. Q2m is main memory only.
	Segment Scan	Check for the presence or absence of data for each segment. If the camera is reconnected after recording, or after switching storage, the current segment Only the data is displayed, so you need to scan all segments to see if there is data for all segments. You need.
	Segment List	Recordings are saved for the segment checked in the leftmost column. If the data has already been saved, you can play back the recorded data stored in the segment. The availability of the recorded data is displayed in the trigger time and segment status. "Reserve" and "Protect" are not supported by Q2m.
Memory clear	1 memory clear	Erase the data in the current segment. Q2m is not supported.
	All memory clear	Erase the data in all recording memories. If the main memory is selected, the number of divisions is also 1.
Automatically save to internal storage.	Q2m is not supported.	

■ Trigger Timing

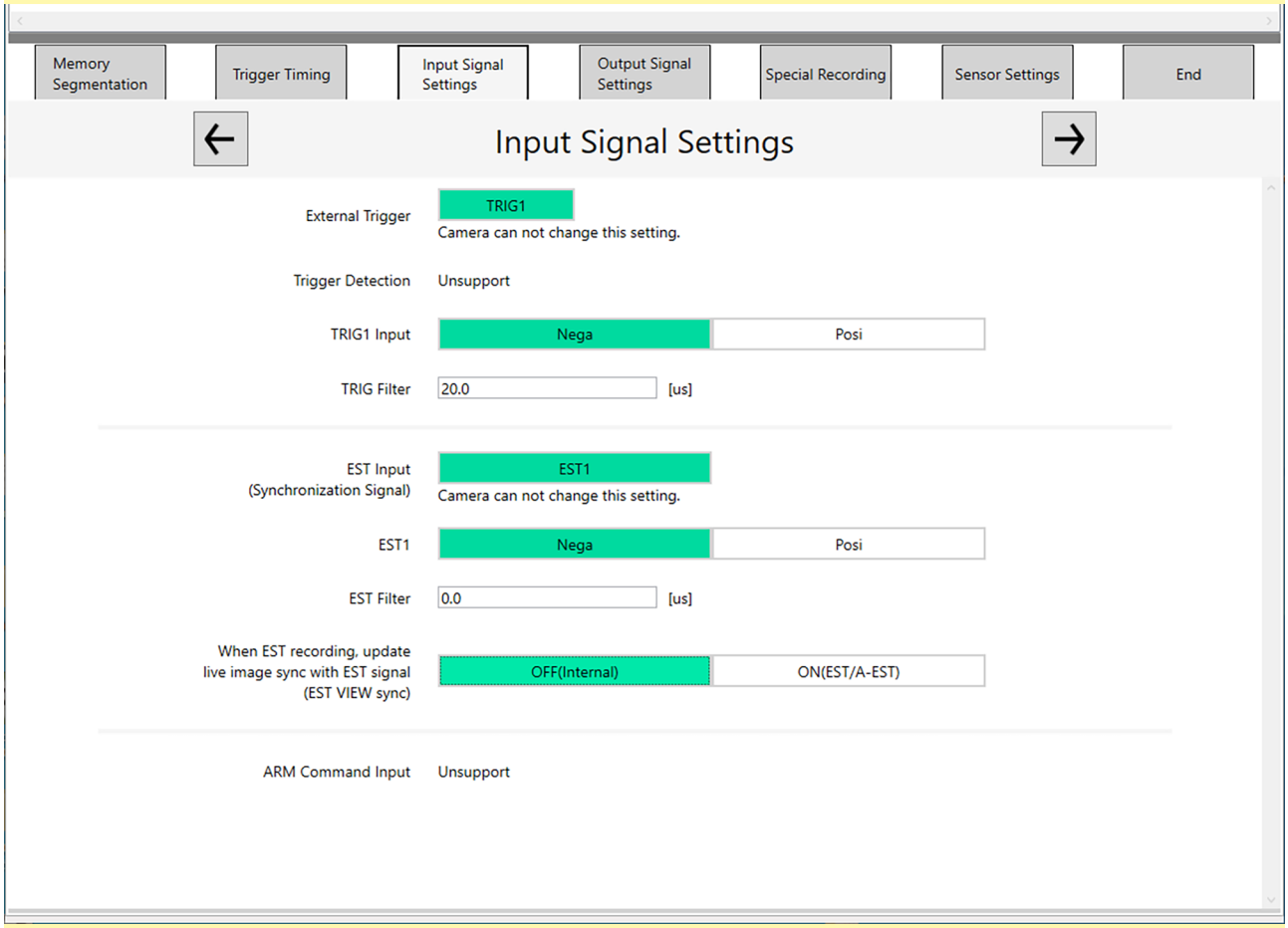


When selecting CUSTOM



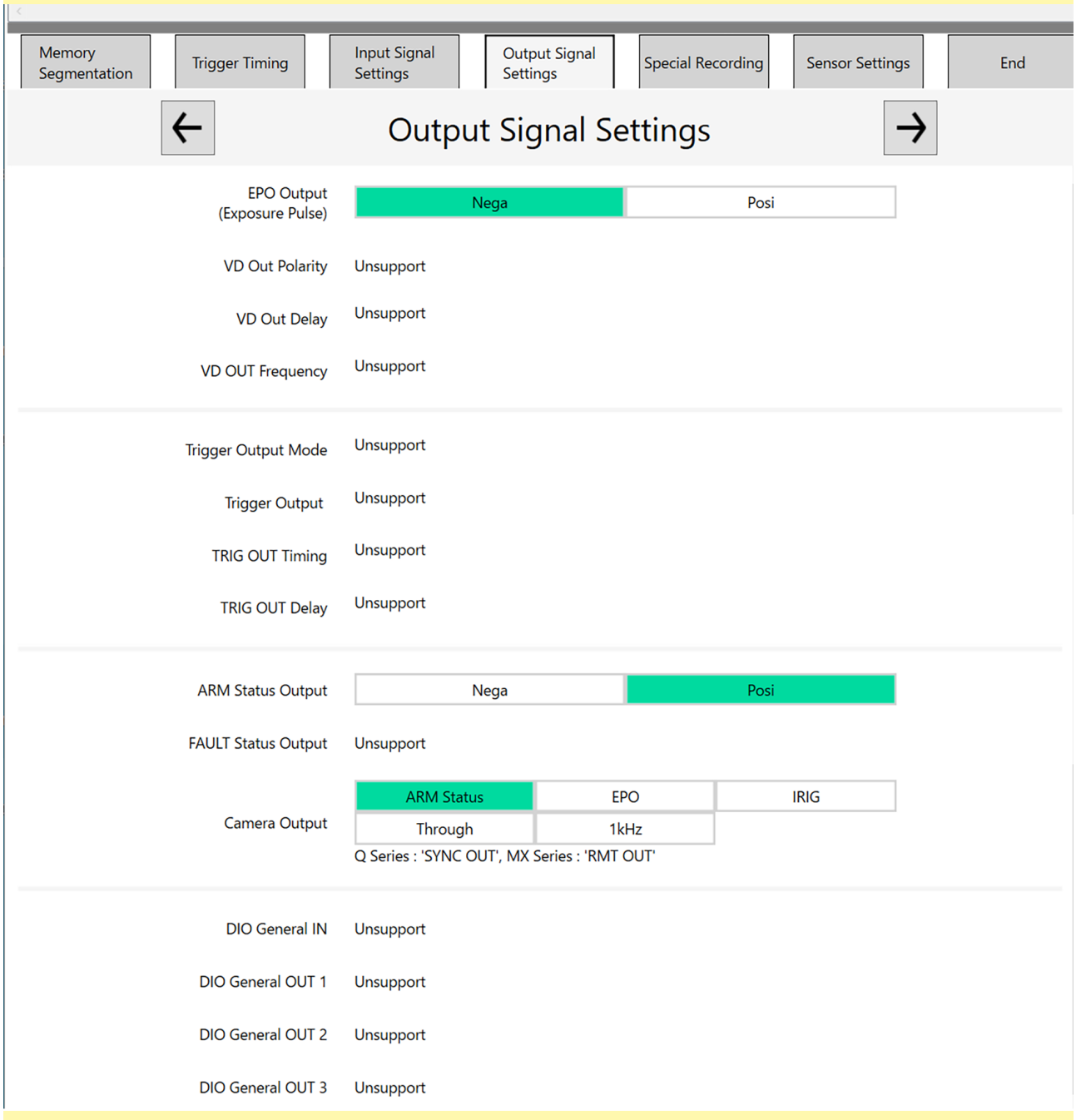
Trigger Timing	Set the recording trigger position.	
	START	The trigger frame is the frame that is approximately 5% after the beginning of the recording memory.
	CENTER	The trigger frame is the center of the recording memory (about 50%).
	END	The trigger frame is the frame about 5% before the end of the recording memory.
	CUSTOM	The trigger frame will be the frame with the value (equivalent to -100 to 100%) set in the trigger timing custom details.
CUSTOM Settings	When selecting Custom, the trigger timing custom details are displayed and the trigger timing can be set in detail.	
	A	Specify the trigger position on the recording memory in percentage. The range is from -100 to 100%. Trigger position can be set by slider.
	B	Starting and ending frames in the recording memory can be specified by frame number.
G-Sensor Trigger	This is the setting for detecting triggers using the G sensor. The trigger is triggered by a shock to the camera body.	
G-Sensor Threshold	Specify the threshold value of G-Sensor Trigger.	

■ Input Signal Settings



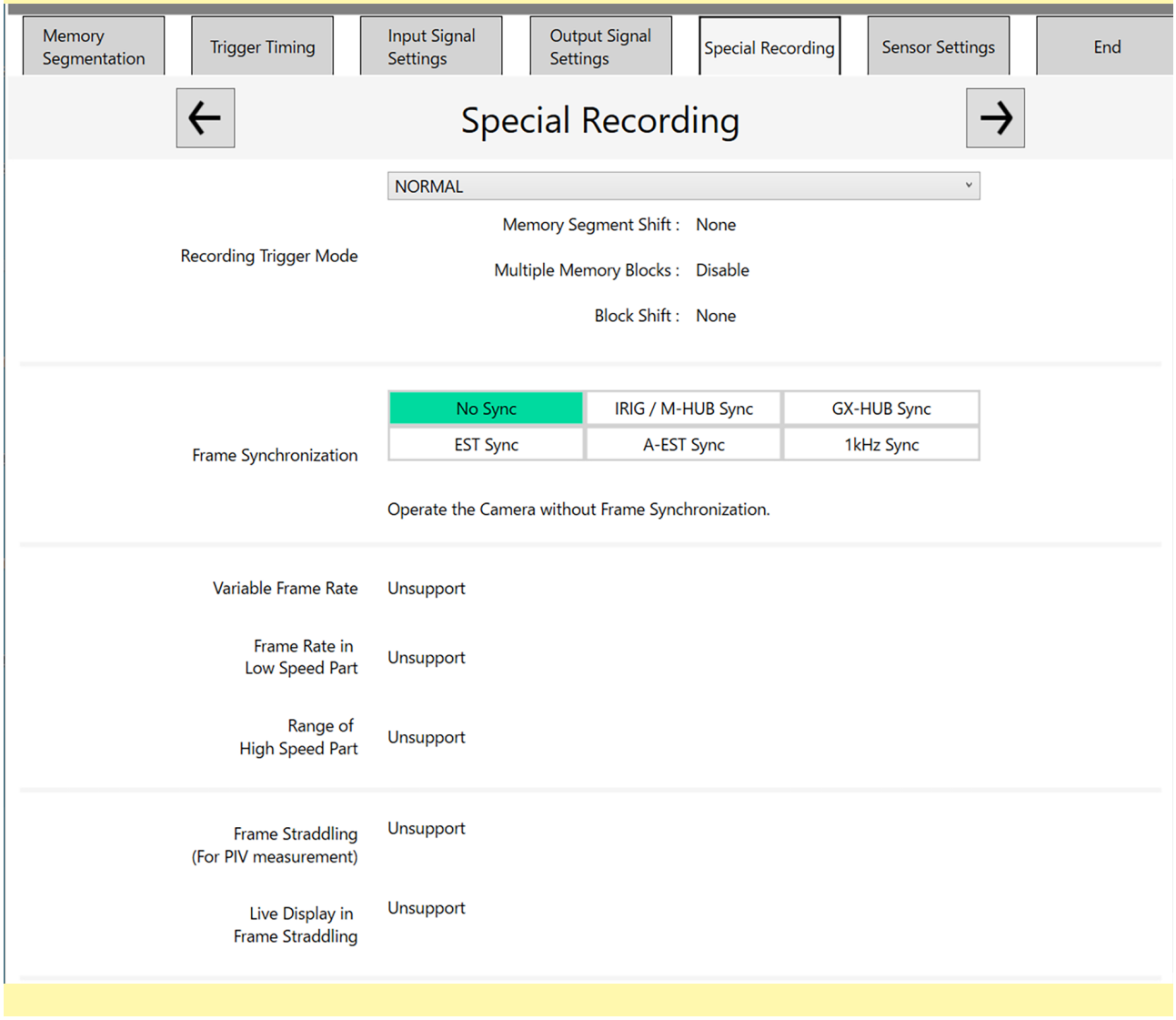
External Trigger	TIRG1 only. Setting cannot be changed with Q2m.	
Trigger Detection	Q2m is not supported.	
TRIG1 Input	Select the polarity of the external trigger signal (contact TTL level). Select "Nega" when not using TRIG1.	
TRIG Filter	Specify the noise filtering effect of the external trigger signal to TRIG in microseconds.	
EST Input	EST1 only. Setting cannot be changed by Q2m.	
EST1	Selects the polarity of the external sync signal.	
EST Filter	Specifies the noise filtering effect of the external synchronous signal to be input to EST1 in microseconds.	
When EST recording, update live image sync with EST signal (EST VIEW sync)	Synchronization setting during VIEW for EST recording.	
	OFF (Internal)	Select when the image is displayed with internal synchronization signals, such as when the EST signals are not input to the HX, GX or Q cameras when in VIEW.
	ON (EST/A-EST)	Select when displaying images synchronized to EST signals during VIEW.
ARM Command Input	Q2m is not supported.	

Output Signal Settings



EPO Output (Exposure Pulse)	Selects the polarity of the exposure pulse (EPO: Exposure Pulse Output).	
VD Out Polarity	Q2m is not supported.	
VD Out Delay		
VD Out Frequency		
Trigger Output Mode		
Trigger Output		
TRIG OUT Timing		
TRIG OUT Delay		
ARM Status Output	Select the polarity of the ARM status signal output by the camera.	
FAULT Status Output	Q2m is not supported.	
Camera Output	This parameter is used to select the sync signal to be output from SYNC OUT in the case of the Q series or RMT OUT in the case of the MX series.	
	ARM Status	The signal is output when the trigger can be received (ARM mode).
	EPO	Select when using another camera (EST input) etc. as the synchronization destination (slave). Outputs the Exposure Pulse Output (EPO) for the first camera. I will. It is also possible to reverse the polarity.
	IRIG	Select to use another camera (IRIG input) as the synchronization destination (slave). The IRIG-B DCLS signal based on the internal time is output.
	Through	Select this to locate relay of sync source (master) and sync destination (slave). Outputs the input signal as it is.
	1kHz	Select when using another camera (1 kHz input) etc. as the synchronization destination (slave). Outputs a 1 kHz signal based on the internal time.
DIO General IN	Q2m is not supported.	
DIO General OUT 1		
DIO General OUT 2		
DIO General OUT 3		

■ Special Recording

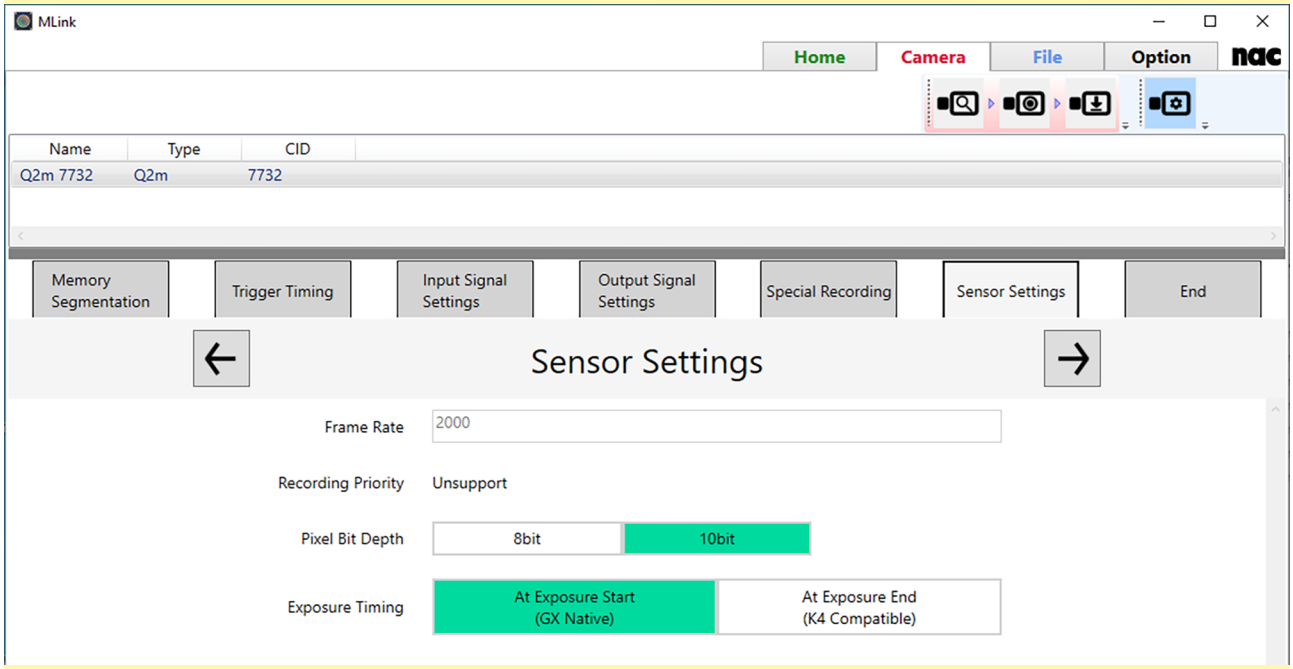


Recording Trigger Mode	Normal only. Setting cannot be changed with Q2m.	
Frame Synchronization	No Sync	Select this when operating with a single Q2m (internal synchronization) or when using this camera as the synchronization source (master). The clock inside the Q2m cuts the time, and the camera frame timing is determined based on that time. When connected from control Windows PC, time is adjusted with the time of PC when connecting.
	IRIG / M-HUB Sync	Select to use IRIG Signal Generator, M-HUB, or another camera (IRIG output) as sync source (master). The time is adjusted by the IRIG-B unmodulated (DCLS) signal from the SYNC IN of the IF connector, and based on that time Determine the frame timing. If the input is lost, it will operate as the Q2m internal time from that time.
	GX-HUB Sync	Select when using GX-HUB or Q-HUB as the synchronization source (master). Similar to "IRIG / M-HUB Sync", but ticks the time based on IRIG-B unmodulated (DCLS) or IRIG-B modulated (AM) signal, when connecting from the control PC, set the time with the time of the PC.
	EST Sync	Select when using a pulse generator or another camera (EPO output) as the synchronization source (master). The frame timing of the camera is determined based on the frame synchronization signal from the SYNC IN of the IF connector. It is used when low speed synchronization such as 100 Hz or less is required. Polarity reversal can also be set.

Frame Synchronization	A-EST Sync	Select when using a pulse generator or another camera (EPO output) as the synchronization source (master). The frame timing of the camera is determined based on the frame synchronization signal from the SYNC IN of the IF connector. Used when high accuracy synchronization is required. Polarity reversal can also be set.
	1kHz Sync	Select this when using an accurate 1 kHz generator as a synchronization source (master) or MEMRECAM with a 1 kHz output function. Based on the 1 KHz signal from the SYNC IN of the IF connector, the time is determined and the frame timing of the camera is determined based on that time.
Variable Frame Rate	Q2m is not supported.	
Frame Rate In Low Speed Part		
Range of High Speed Part		
Frame Straddling (For PIV measurement)		
Live display in Frame Straddling		

ATTENTION •M-HUB is a product for multi camera system for MEMRECAM fx series. MLink does not support fx series, but it is shown for compatibility with conventional products.

■ Sensor Settings



Frame Rate	Shows the recording frame rate of the camera.	
Recording Priority	Q2m is not supported.	
Pixel Bit Depth	Sets the number of recording bits per pixel.	
	8bit	The upper 8 bits of the output of the image sensor section are recorded, and the lower 2 bits are not recorded. Long time recording, data size shrink.
	10bit	Records with priority of 10 bit image sensor output Standard image quality
Exposure Timing	Sets whether the camera's exposure timing should be adjusted to the rising edge of the sync signal or falling edge of the sync signal.	
	At Exposure Start (GX Native)	Start exposure at the start of the synchronization signals.
	At Exposure End (K4 Compatible)	Start exposure at the end of the synchronization signals.

ResQ ADAPTER SYSTEM

If something abnormal occurs with the Q2m, 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.

4

Specifications

Image Sensor

■ Image Sensor

Format	Approx 4/3 inch size CMOS sensor (color / monochome)
Pixel size	10μm square pixel
Valid Pixels	1920 × 1080 pixels
Maximum Area	19.2 × 10.8 mm
Precision Around the Optical Axis	±0.88mm

■ Frame Rates

Preset Frame Rates	50, 60, 100, 250, 500, 1,000, 2,000, 2,500, 3,000, 3,500,
	4,000, 5,000, 6,000, 8,000, 9,000, 10,000, 15,000,
	20,000, 30,000, 40,000, 50,000, 80,000, 100000

Attention •There is no custom frame rate function.

■ Frame Rates and Valid Pixels (1/3)

Maximum Frame Rate (fps)	Valid Pixels		Valid Image Area (mm)		Horizontal-Vertical Ratio (Size)
	Horizontal	Vertical	Horizontal	Vertical	
50 to 2,000	1920	1080	19.20	10.80	16: 9 (HDTV full HD)
2,500	1920	1024	19.20	10.24	Split
	1536	1024	15.36	10.24	Split
	1280	1024	12.80	10.24	5:4 (SXGA)
	1920	960	19.20	9.60	Split
	1280	960	12.80	9.60	4:3
3,000	1920	768	19.20	7.68	Split
	1280	768	12.80	7.68	Split
	1024	768	12.80	9.60	4:3
3,500	1920	720	19.20	7.20	Split
	1280	720	12.80	7.20	16:9
4,000	1920	576	19.20	5.76	Split
	1280	576	12.80	5.76	Split
	768	576	7.68	5.76	4:3
5,000	1920	512	19.20	5.12	Split
	1280	512	12.80	5.12	Split
	768	512	7.68	5.12	Split
	1920	480	19.20	4.80	Split
	1280	480	12.50	4.80	Split
	640	480	6.40	4.80	4:3 (VGA)

Frame Rates and Valid Pixels (2/3)

Maximum Frame Rate (fps)	Valid Pixels		Valid Image Area (mm)		Horizontal-Vertical Ratio (Size)
	Horizontal	Vertical	Horizontal	Vertical	
6,000	1920	384	19.20	3.84	Split
	1280	384	12.80	3.84	Split
	640	384	6.40	3.84	Split
	512	384	5.12	3.84	4:3
8,000	1920	320	19.20	3.20	Split
	1280	320	12.80	3.20	Split
	640	320	6.40	3.20	Split
9,000	1920	288	19.20	2.88	Split
	1280	288	12.80	2.88	Split
	640	288	6.40	2.88	Split
	384	288	3.84	2.88	4:3
10,000	1920	240	19.20	2.40	Split
	1280	240	12.80	2.40	Split
	640	240	6.40	2.40	Split
	320	240	3.20	2.40	4:3 (QVGA)
15,000	1920	144	19.20	1.44	Split
	1280	144	12.80	1.44	Split
	640	144	6.40	1.44	Split
	192	144	1.92	1.44	4:3
20,000	1920	96	19.20	0.96	Split
	1280	96	12.80	0.96	Split
	640	96	6.40	0.96	Split
	128	96	1.28	0.96	4:3
30,000	1920	64	19.20	0.64	Split
	1280	64	12.80	0.64	Split
	640	64	6.40	0.64	Split
	128	64	1.28	0.64	Split
40,000	1920	48	19.20	0.48	Split
	1280	48	12.80	0.48	Split
	640	48	6.40	0.48	Split
	128	48	1.28	0.48	Split

Frame Rates and Valid Pixels (3/3)

Maximum Frame Rate (fps)	Valid Pixels		Valid Image Area (mm)		Horizontal-Vertical Ratio (Size)
	Horizontal	Vertical	Horizontal	Vertical	
50,000	1920	32	19.20	0.32	Split
	1280	32	12.80	0.32	Split
	640	32	6.40	0.32	Split
	128	32	1.28	0.32	Split
80,000	1920	16	19.20	0.16	Split
	1280	16	12.80	0.16	Split
	640	16	6.40	0.16	Split
	128	16	1.28	0.16	Split
100,000	1920	8	19.20	0.08	Split
	1280	8	12.80	0.08	Split
	640	8	6.40	0.08	Split
	128	8	1.28	0.08	Split

Attention

- Fps (frame per second) is the unit of recording speed = frame / second.
- The number of pixels recorded in the memory is the same as the effective pixel number.
- 50 to 2,000 fps is 50, 60, 100, 250, 500, 1,000, 2,000 fps.
- The shutter speed at 50, 60 fps is the longest 1/100 second.

■ Preset table of frame rate and frame size (1/3)

Frame Rate (fps)	Frame size						
	128×8 640×8 1280×8 1920×8	128×16 640×16 1280×16 1920×16	128×32 640×32 1280×32 1920×32	128×48 640×48 1280×48 1920×48	128×64 640×64 1280×64 1920×64	128×96 640×96 1280×96 1920×96	192×144 640×144 1280×144 1920×144
50	√	√	√	√	√	√	√
60	√	√	√	√	√	√	√
100	√	√	√	√	√	√	√
250	√	√	√	√	√	√	√
500	√	√	√	√	√	√	√
1,000	√	√	√	√	√	√	√
2,000	√	√	√	√	√	√	√
2,500	√	√	√	√	√	√	√
3,000	√	√	√	√	√	√	√
3,500	√	√	√	√	√	√	√
4,000	√	√	√	√	√	√	√
5,000	√	√	√	√	√	√	√
6,000	√	√	√	√	√	√	√
8,000	√	√	√	√	√	√	√
9,000	√	√	√	√	√	√	√
10,000	√	√	√	√	√	√	√
15,000	√	√	√	√	√	√	√
20,000	√	√	√	√	√	√	
30,000	√	√	√	√	√		
40,000	√	√	√	√			
50,000	√	√	√				
80,000	√	√					
100,000	√						

■ Preset table of frame rate and frame size (2/3)

Frame Rate (fps)	Frame size						
	320×240 640×240 1280×240 1920×240	384×288 640×288 1280×288 1920×288	640×320 1280×320 1920×320	512×384 640×384 1280×384 1920×384	640×480 1280×480 1920×480	768×512 1280×512 1920×512	768×576 1280×576 1920×576
50	√	√	√	√	√	√	√
60	√	√	√	√	√	√	√
100	√	√	√	√	√	√	√
250	√	√	√	√	√	√	√
500	√	√	√	√	√	√	√
1,000	√	√	√	√	√	√	√
2,000	√	√	√	√	√	√	√
2,500	√	√	√	√	√	√	√
3,000	√	√	√	√	√	√	√
3,500	√	√	√	√	√	√	√
4,000	√	√	√	√	√	√	√
5,000	√	√	√	√	√	√	
6,000	√	√	√	√			
8,000	√	√	√				
9,000	√	√					
10,000	√						
15,000							
20,000							
30,000							
40,000							
50,000							
80,000							
100,000							

■ Preset table of frame rate and frame size (3/3)

Frame Rate (fps)	Frame size				
	1280×720 1920×720	1024×768 1280×768 1920×768	1280×960 1920×960	1280×1024 1536×1024 1920×1024	1920×1080
50	√	√	√	√	√
60	√	√	√	√	√
100	√	√	√	√	√
250	√	√	√	√	√
500	√	√	√	√	√
1,000	√	√	√	√	√
2,000	√	√	√	√	√
2,500	√	√	√	√	
3,000	√	√			
3,500	√				
4,000					
5,000					
6,000					
8,000					
9,000					
10,000					
15,000					
20,000					
30,000					
40,000					
50,000					
80,000					
100,000					

■ Sensitivity

Color	ISO 8,000 (1,440 lux, F4, 2,000 fps, shutter 1/2,000s, Digital Gain: MID)
Mono	ISO 32,000 (360 lux, F4, 2,000 fps, shutter 1/2,000s, Digital Gain: MIDE)

Attention •The sensitivity is the value at 2,000 frames per second (full resolution).

■ Shutter

Shutter shutter	Electronic shutter (global shutter)
Shutter Time Settings Method	Select from presets / Custom settings
Presets	1/100, 1/250, 1/500, 1/1,000, 1/2,000, 1/5,000, 1/10,000, 1/20,000, 1/50,000, 1/100,000, 1/200,000, 1/333,333, 1/500,000 s (at preset pixel counts from 50 to 100,000 fps)
Custom Settings	1.1 to 9,999µs (= 10ms = 1/100s) (According to framing rate)

■ Lens Mount

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

■ Timing Compatibility with Existing Products

Q2m Standard Timing	Shutter exposure start timing (GX native)
fx Compatible Timing	Shutter exposure end timing (K4 compat)

Recorder

■ Recording Memory Capacity

Internal Memory Capacity	8GB or 16GB	
Memory Segment Partitions	8GB model	266MB×32, 532MB×16, 1.0GB×8, 2.1GB×4, 4.2GB×2, 8.5GB×1
	16GB model	532MB×32, 1.0GB×16, 2.1GB×8, 4.2GB×4, 8.5GB×2, 17GB×1

Attention

- Since the memory capacity has an area of internal use, the capacity available for recording is smaller than the implemented memory.

■ Recording Bit Length

Image Sensor Output	10 bit	
Recording bit per pixel	10 bit	Records with priority of 10 bit image sensor output Standard image quality
	8bit	The upper 8 bits of the output of the image sensor section are recorded, and the lower 2 bits are not recorded. Long time recording, data size shrink.

■ Recording Time · Number of recordable pictures (8GB 1/3)

No memory segment partitions

Frame Rate (fps)	Frame size		Recording Time (sec)		Number of recordable pictures	
	Horizontal	Vertical	10bit	8bit	10bit	8bit
50	1920	1080	65.68	82.12	3,284	4,106
60	1920	1080	54.73	68.43	3,284	4,106
100	1920	1080	32.84	41.06	3,284	4,106
250	1920	1080	13.13	16.42	3,284	4,106
500	1920	1080	6.56	8.21	3,284	4,106
1,000	1920	1080	3.28	4.1	3,284	4,106
2,000	1920	1080	1.64	2.05	3,284	4,106
2,500	1920	1024	1.38	1.73	3,464	4,330
2,500	1536	1024	1.73	2.16	4,330	5,413
2,500	1280	1024	2.07	2.59	5,196	6,496
2,500	1920	960	1.47	1.84	3,695	4,619
2,500	1280	960	2.21	2.77	5,543	6,929
3,000	1920	768	1.53	1.92	4,619	5,774
3,000	1280	768	2.3	2.88	6,929	8,661
3,000	1024	768	2.88	3.6	8,661	10,826
3,500	1920	720	1.4	1.75	4,927	6,159
3,500	1280	720	2.11	2.63	7,391	9,238
4,000	1920	576	1.53	1.92	6,159	7,698
4,000	1280	576	2.3	2.88	9,238	11,548
4,000	768	576	3.84	4.81	15,397	19,247
5,000	1920	512	1.38	1.73	6,929	8,661
5,000	1280	512	2.07	2.59	10,393	12,992
5,000	768	512	3.46	4.33	17,322	21,653
5,000	1920	480	1.47	1.84	7,391	9,238
5,000	1280	480	2.21	2.77	11,086	13,858
5,000	640	480	4.43	5.54	22,173	27,716

■ Recording Time · Number of recordable pictures (8GB 2/3)

No memory segment partitions

Frame Rate (fps)	Frame size		Recording Time (sec)		Number of recordable pictures	
	Horizontal	Vertical	10bit	8bit	10bit	8bit
6,000	1920	384	1.53	1.92	9,238	11,548
6,000	1280	384	2.3	2.88	13,858	17,322
6,000	640	384	4.61	5.77	27,716	34,645
6,000	512	384	5.77	7.21	34,645	43,306
8,000	1920	320	1.38	1.73	11,086	13,858
8,000	1280	320	2.07	2.59	16,629	20,787
8,000	640	320	4.15	5.19	33,259	41,574
9,000	1920	288	1.36	1.71	12,318	15,397
9,000	1280	288	2.05	2.56	18,477	23,096
9,000	640	288	4.1	5.13	36,955	46,193
9,000	384	288	6.84	8.55	61,591	76,989
10,000	1920	240	1.47	1.84	14,782	18,477
10,000	1280	240	2.21	2.77	22,173	27,716
10,000	640	240	4.43	5.54	44,346	55,432
10,000	320	240	8.86	11.08	88,692	110,865
15,000	1920	144	1.64	2.05	24,636	30,795
15,000	1280	144	2.46	3.07	36,955	46,193
15,000	640	144	4.92	6.15	73,910	92,387
15,000	192	144	16.42	20.53	246,366	307,958
20,000	1920	96	1.84	2.3	36,955	46,193
20,000	1280	96	2.77	3.46	55,432	69,290
20,000	640	96	5.54	6.92	110,865	138,581
20,000	128	96	27.71	34.64	554,325	692,906

■ Recording Time · Number of recordable pictures (8GB 3/3)

No memory segment partitions

Frame Rate (fps)	Frame size		Recording Time (sec)		Number of recordable pictures	
	Horizontal	Vertical	10bit	8bit	10bit	8bit
30,000	1920	64	1.84	2.3	55,432	69,290
30,000	1280	64	2.77	3.46	83,148	103,936
30,000	640	64	5.54	6.92	166,297	207,872
30,000	128	64	27.71	34.64	831,488	1,039,360
40,000	1920	48	1.84	2.3	73,910	92,387
40,000	1280	48	2.77	3.46	110,865	138,581
40,000	640	48	5.54	6.92	221,730	277,162
40,000	128	48	27.71	34.64	1,108,650	1,385,813
50,000	1920	32	2.21	2.77	110,865	138,581
50,000	1280	32	3.32	4.15	166,297	207,872
50,000	640	32	6.65	8.31	332,595	415,744
50,000	128	32	33.25	41.57	1,662,976	2,078,720
80,000	1920	16	2.77	3.46	221,730	277,162
80,000	1280	16	4.15	5.19	332,595	415,744
80,000	640	16	8.31	10.39	665,190	831,488
80,000	128	16	41.57	51.96	3,325,952	4,157,440
100,000	1920	8	4.43	5.54	443,460	554,325
100,000	1280	8	6.65	8.31	665,190	831,488
100,000	640	8	13.3	16.62	1,330,380	1,662,976
100,000	128	8	66.51	83.14	6,651,904	8,314,880

■ Recording Time · Number of recordable pictures (16GB 1/3)

No memory segment partitions

Frame Rate (fps)	Frame size		Recording Time (sec)		Number of recordable pictures	
	Horizontal	Vertical	10bit	8bit	10bit	8bit
50	1920	1080	131.96	164.96	6,598	8,248
60	1920	1080	109.96	137.46	6,598	8,248
100	1920	1080	65.98	82.48	6,598	8,248
250	1920	1080	26.39	32.99	6,598	8,248
500	1920	1080	13.19	16.49	6,598	8,248
1,000	1920	1080	6.59	8.24	6,598	8,248
2,000	1920	1080	3.29	4.12	6,598	8,248
2,500	1920	1024	2.78	3.47	6,959	8,699
2,500	1536	1024	3.47	4.34	8,699	10,874
2,500	1280	1024	4.17	5.21	10,439	13,049
2,500	1920	960	2.96	3.71	7,423	9,279
2,500	1280	960	4.45	5.56	11,135	13,919
3,000	1920	768	3.09	3.86	9,279	11,599
3,000	1280	768	4.63	5.79	13,919	17,399
3,000	1024	768	5.79	7.24	17,399	21,749
3,500	1920	720	2.82	3.53	9,898	12,372
3,500	1280	720	4.24	5.3	14,847	18,559
4,000	1920	576	3.09	3.86	12,372	15,466
4,000	1280	576	4.63	5.79	18,559	23,199
4,000	768	576	7.73	9.66	30,932	38,665
5,000	1920	512	2.78	3.47	13,919	17,399
5,000	1280	512	4.17	5.21	20,879	26,099
5,000	768	512	6.95	8.69	34,798	43,498
5,000	1920	480	2.96	3.71	14,847	18,559
5,000	1280	480	4.45	5.56	22,271	27,839
5,000	640	480	8.9	11.13	44,542	55,678

■ Recording Time · Number of recordable pictures (16GB 2/3)

No memory segment partitions

Frame Rate (fps)	Frame size		Recording Time (sec)		Number of recordable pictures	
	Horizontal	Vertical	10bit	8bit	10bit	8bit
6,000	1920	384	3.09	3.86	18,559	23,199
6,000	1280	384	4.63	5.79	27,839	34,798
6,000	640	384	9.27	11.59	55,678	69,597
6,000	512	384	11.59	14.49	69,597	86,997
8,000	1920	320	2.78	3.47	22,271	27,839
8,000	1280	320	4.17	5.21	33,406	41,758
8,000	640	320	8.35	10.43	66,813	83,517
9,000	1920	288	2.74	3.43	24,745	30,932
9,000	1280	288	4.12	5.15	37,118	46,398
9,000	640	288	8.24	10.31	74,237	92,797
9,000	384	288	13.74	17.18	123,729	154,661
10,000	1920	240	2.96	3.71	29,695	37,118
10,000	1280	240	4.45	5.56	44,542	55,678
10,000	640	240	8.9	11.13	89,085	111,356
10,000	320	240	17.81	22.27	178,170	222,713
15,000	1920	144	3.29	4.12	49,491	61,864
15,000	1280	144	4.94	6.18	74,237	92,797
15,000	640	144	9.89	12.37	148,475	185,594
15,000	192	144	32.99	41.24	494,918	618,647
20,000	1920	96	3.71	4.63	74,237	92,797
20,000	1280	96	5.56	6.95	111,356	139,195
20,000	640	96	11.13	13.91	222,713	278,391
20,000	128	96	55.67	69.59	1,113,565	1,391,957

■ Recording Time · Number of recordable pictures (16GB 3/3)

No memory segment partitions

Frame Rate (fps)	Frame size		Recording Time (sec)		Number of recordable pictures	
	Horizontal	Vertical	10bit	8bit	10bit	8bit
30,000	1920	64	3.71	4.63	111,356	139,195
30,000	1280	64	5.56	6.95	167,034	208,793
30,000	640	64	11.13	13.91	334,069	417,587
30,000	128	64	55.67	69.59	1,670,348	2,087,936
40,000	1920	48	3.71	4.63	148,475	185,594
40,000	1280	48	5.56	6.95	222,713	278,391
40,000	640	48	11.13	13.91	445,426	556,782
40,000	128	48	55.67	69.59	2,227,131	2,783,914
50,000	1920	32	4.45	5.56	222,713	278,391
50,000	1280	32	6.68	8.35	334,069	417,587
50,000	640	32	13.36	16.7	668,139	835,174
50,000	128	32	66.81	83.51	3,340,697	4,175,872
80,000	1920	16	5.56	6.95	445,426	556,782
80,000	1280	16	8.35	10.43	668,139	835,174
80,000	640	16	16.7	20.87	1,336,279	1,670,348
80,000	128	16	83.51	104.39	6,681,395	8,351,744
100,000	1920	8	8.9	11.13	890,852	1,113,565
100,000	1280	8	13.36	16.7	1,336,279	1,670,348
100,000	640	8	26.72	33.4	2,672,558	3,340,697
100,000	128	8	133.62	167.03	13,362,790	16,703,488

■ Live Image Output

Output Method	Live PC output via Ethernet. The raw data received by the PC from MEMRECAM is converted and displayed as an image.
Refresh Rate	Depends on PC performance, network conditions and recording resolution ● About 5-10 frames/sec Q2m When the display resolution is 1920x1080

■ Recording condition

Recording Start Conditions	ARM Command (ARM from MLink or such)
Recording End Conditions	● Recording Trigger input (IF connector TRIG) ● REC Command (REC from MLink or such) ● G Sensor Trigger (Shock detection using acceleration sensor) ● At the time of a rise in camera temperature abnormality (from MLink, possible current temperature display by the property display of the camera) ● Stop command (Network: STOP from MLink etc.)

■ Trigger Timing

START	The trigger point is about 5% after 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	Trigger point is a predetermined number (-100 to 100%) Set in 1% steps or 1 frame

■ 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

CHECK • Of the simultaneous recording data for each frame, MLink can check the following information.

Frame exposure center time (date, time, minutes, seconds, in 0.1 μsec increments)

Event

Acceleration

System Control

■ Status LED (1/2)

LED	Status LED	Operation
MODE Camera Mode Display	Orange (Blinking)	REC mode (Blinking: set to A-EST / EST mode, EST pulse input)
	Blue	STOP / READY mode
	White (Blinking)	VIEW mode (Blinking: set to A-EST /EST mode, EST pulse input)
	Magenta (Blinking)	ARM mode (camera video output, recorded memory contents are destroyed, new camera video is recorded in memory) (Blinking: set to A-EST /EST mode, EST pulse input)
	Not lit	Power OFF or starting up
STATUS Displays power ON, fail status	Green	Normal operation
	Red	Fail state (Abnormal power voltage detected)
	Red (Blinking)	Fail state: Sensor temperature rise detection. (Slow Blinking = Caution, Blinking = Danger)
	Not lit	Power OFF or starting up
ETHER Displays Ethernet connection status	Orange (Blinking)	Network communicating at 1000BASE-T Blinking in ACT status.
	Green (Blinking)	Network communicating at 100BASE-TX Blinking in ACT status.
	Not lit	No network connection or Power OFF

■ 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

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.
- The battery charge level, is not an accurate indication because it is affected by individual battery differences and environmental temperatures.
  Use it as a guide.
- If the blinking LED changes from orange to red during battery memory backup, recharge the battery immediately.
- In the event of a thermal shutdown, turn off the power to the camera. After a short period of time, turn the camera back on.

■ 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:	AAA 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/16GB models on a full charge)	
Battery Backup Start Conditions	DC input voltage of 17.0V or less to Q2m after recording starts	
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	STATUS LED	
	Red: low charge	
	Orange: medium charge	
	Green: full charge	
Battery replacement	Please contact your dealer or us.	

CHECK

- The battery is designed to move to trickle charging after being fully charged and to reduce deterioration due to overcharging.
- Battery life can be prolonged by avoiding charging the battery for more than three days when in use.

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 18 to 36V
	Input power	DC 18 to 36V
	Power consumption	About 24W (ARM MODE, DC36V)
	Power protection	Overvoltage 37VDC, 1 minute
ETHER	1000BASE-T (IEEE802.3ab), isolation	

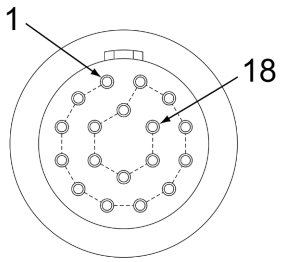
Attention

- If the negative (-) terminal of the DC power supply (AC/DC adapter, battery, etc.) is connected to the FG (frame ground) of the DC power supply, reverse connection may not be protected and malfunction or ignition of electronic parts may occur.

SYNC IN	Signal Level:	CMOS level, isolation 5V pull-up resistor 4700 ohms 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) 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
	Function:	IRIG (DCLS) / SYNC 1kHz / THRU / EPO / ARM Status output Falling (H -> L) : Start exposure Rising (L -> H) : End exposure
PWRCTL	Signal level:	CMOS level, isolation 5V pull-up resistor 4700 ohms 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 5V pull-up resistor 4700 ohms 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	-	SYNC input signal return	Ground isolation
11	DC IN	IN	DC power input	
12	DC IN RTN	IN	DC power return	
13	TRIG IN	IN	CMOS, contact	Isolation
14	TRIG IN RTN	-	TRIG input signal return	Ground isolation
15	SYNC OUT	OUT	CMOS	Isolation
16	SYNC OUT RTN	-	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, Dimensional Drawings

■ Shape

Exterior dimensions (W×H×D)	About W62×H62×D87.5mm (Excluding connector, protruding parts and mounting parts)	
Main unit weight	About 670g (Camera unit only. Excluding mounting cap and such)	
Mounting screws	Top, bottom, left.	6 M4 threaded holes each, 4mm deep
	Right	6 M4 threaded holes, 5 mm deep
	Front	Four M4 threaded holes, 7mm deep

■ 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
Shock	Shock 6-axis half-sine, 200G/7msec, 150G/11msec

■ 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).

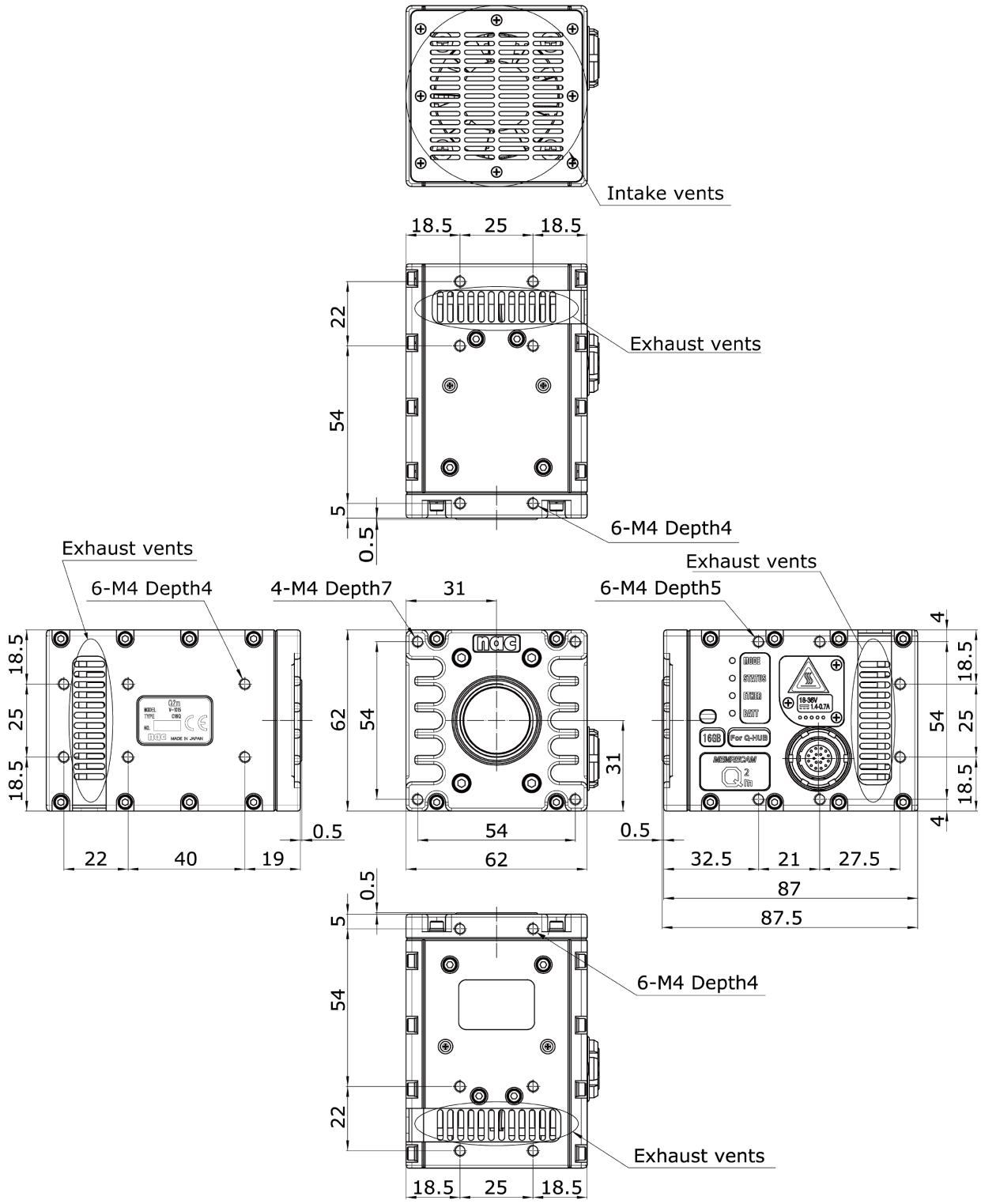
■ Application Standards

Safety standard	EN62368
Electromagnetic compatibility	EN55032, EN55035, FCC Part 15 Subpart B Class A

■ 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

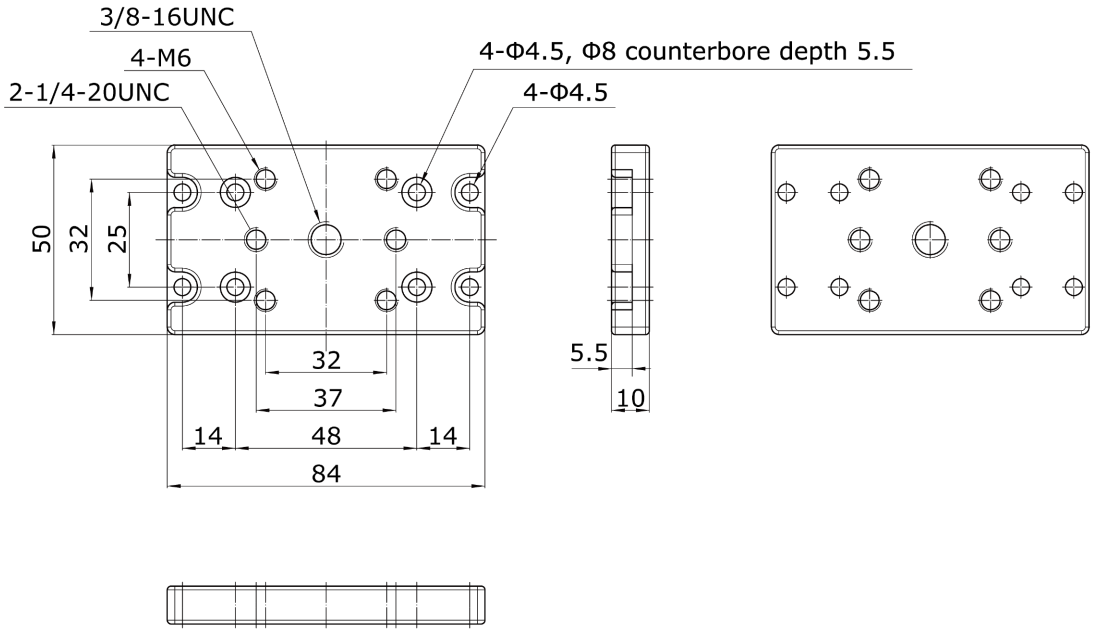
■ Dimensional Drawings MEMRECAM Q2m



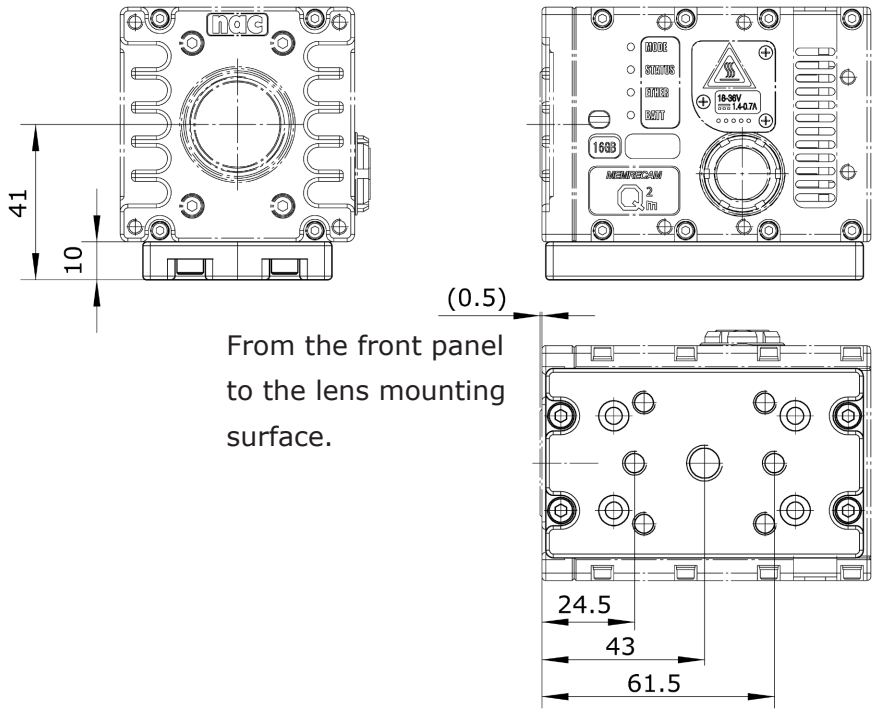
Main Attachments, Options

■ Tripod Plate (attached)

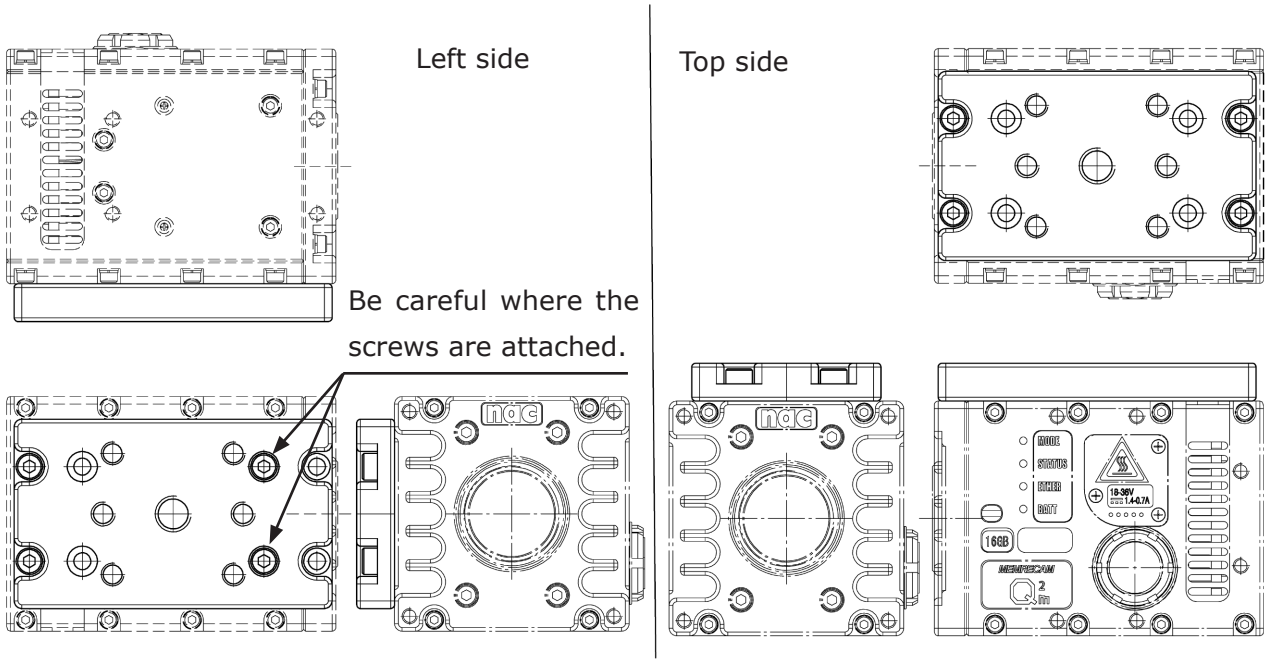
Exterior dimensions (W×H×D)	About W50×H84×D10mm (Not including mounting screws, etc.)
Weight	Approximately 100g



Q2m installed (the figure shows the Q2m

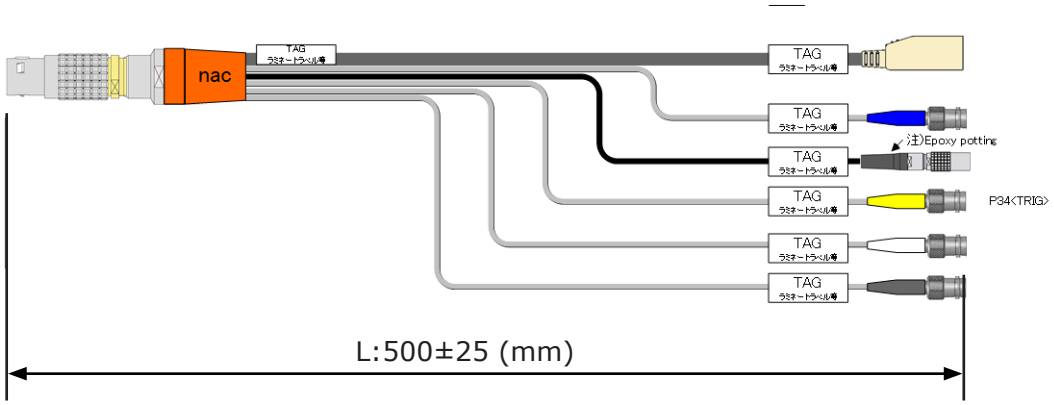


The tripod plate can be attached to the left side and the top.



■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

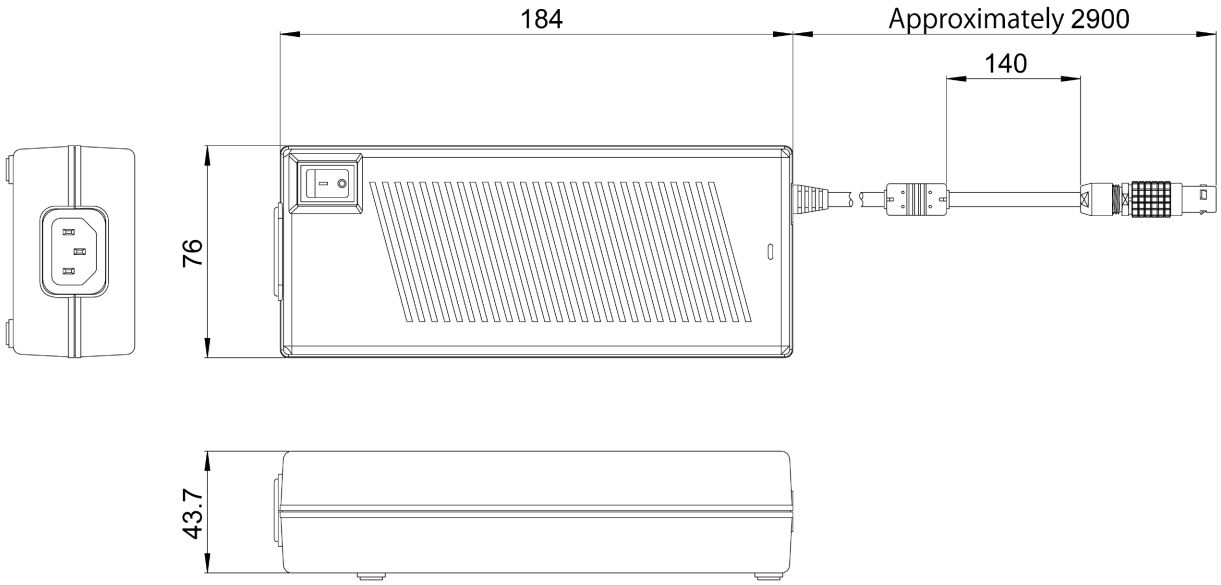


■Q-Cam Extension Cable (sold separately)

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

■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	



■ Q2 KIT (sold separately)

DVD-ROM	MEMRECAM Control Software DVD-ROM	PC control software MLink DVD-ROM
CD-ROM	Q2m User's Manual:	Camera user's manual electronic version (this document)

■ Control Software MLink

OS	Windows 7 Ultimate / Professional (32/64bit) Windows 8 / 8.1 Pro (32/64bit) Windows 10 Pro (32/64bit) (Only the latest Windows 10 update will be tested) .NET Framework 4.7.1 or later
Memory	8GB or more [16GB or more recommended]
Display	Full color 1024 x 768 or more [1920 x 1080 or more recommended]
HDD	2GB or more for programming and logging 250 GB or more for data (2 TB or more recommended) (depending on the number of cameras and the number of frames to be stored)
Network	Gigabit Ethernet (LAN cable category 5e or higher)
Optical drive	1 optical drive (DVD drive, for installation)

■ Q2 Camera Case (sold separately)

External dimensions (W×H×D)	Approximately W414 × H345 × D129 mm
Weight	Approximately 2.9kg

5

Q-HUB

(00477)B

Q-HUB Features

High speed photography is possible in a variety of environments simply by combining the MEMRECAM Q2m/Q1m/Q1v and Q5 and the Q-HUB.

Recording with up to 4 Q2m cameras is possible with 1 Q-HUB

A maximum of four MEMRECAM Q2m can be connected with one Q-HUB. The cameras can be powered and controlled.

Cascade connections are possible

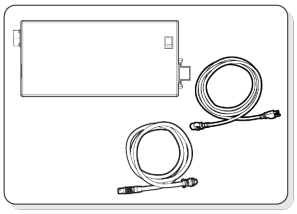
Q-HUBs can be connected each other up to 3x Q-HUBs depending on IT environment (⏭🕮 5-17).

A multiple camera system can be built with your current camera

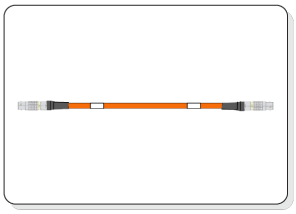
A multiple camera system configuration is possible by using the MEMRECAM GX series, the HX series and the GX-HUB.

Main Options

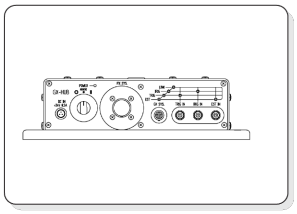
The following are the main Q-HUB options.



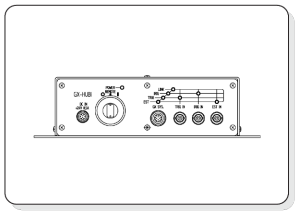
● AC POWER SYSTEM



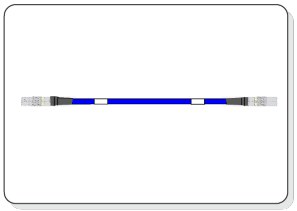
● Q-Cam Remote Cable



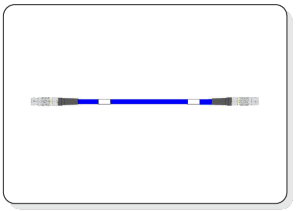
● GX-HUB



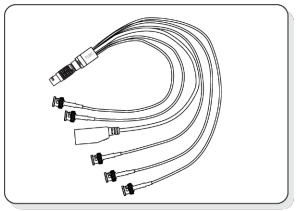
● GX-HUBi



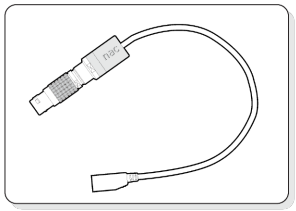
● GX Remote Cable
(for the GX-HUB)



● 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 Q2m 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 (for the GX-HUB)	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 The two types of BNC connectors include the plug type and the receptacle type.
● Simple J3 cable	Cable for connecting the PC for joint control of the HX and GX series

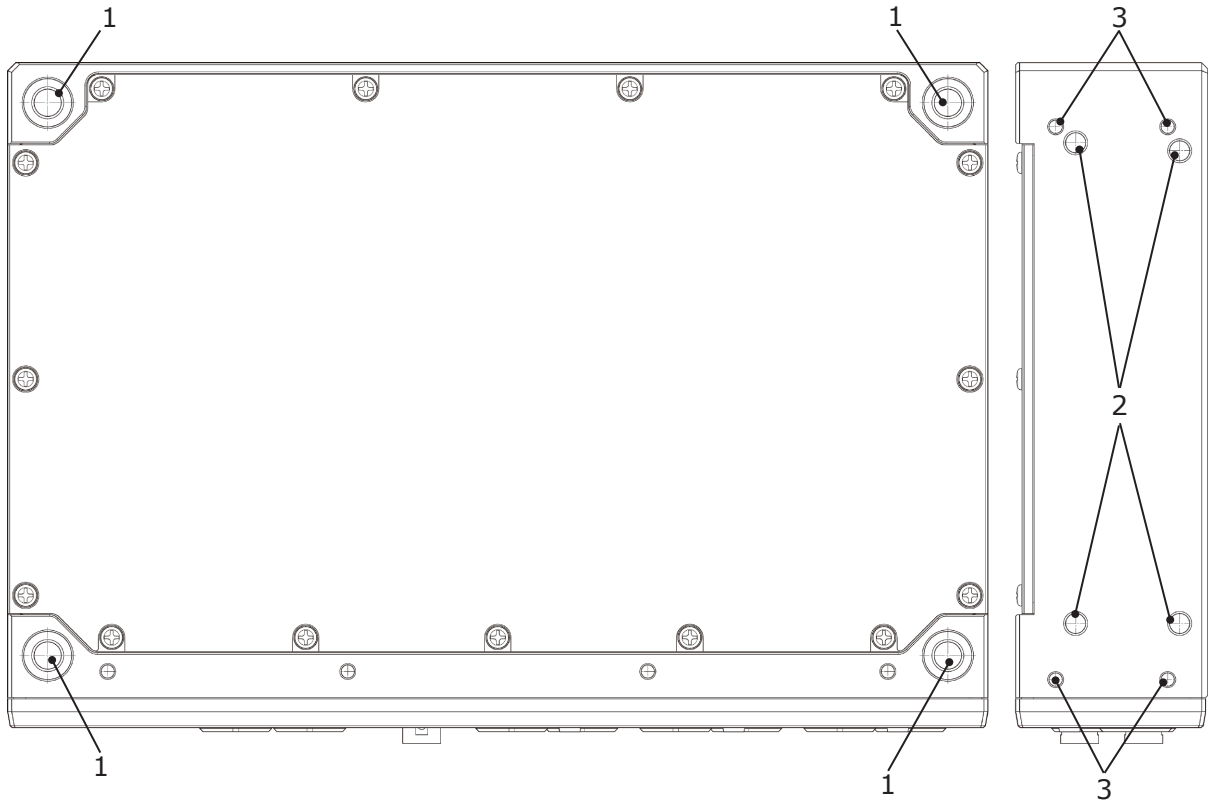
Attention

- 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.

External Appearance and Names for this Unit

External Appearance and Names for this Unit

Top, Right Side

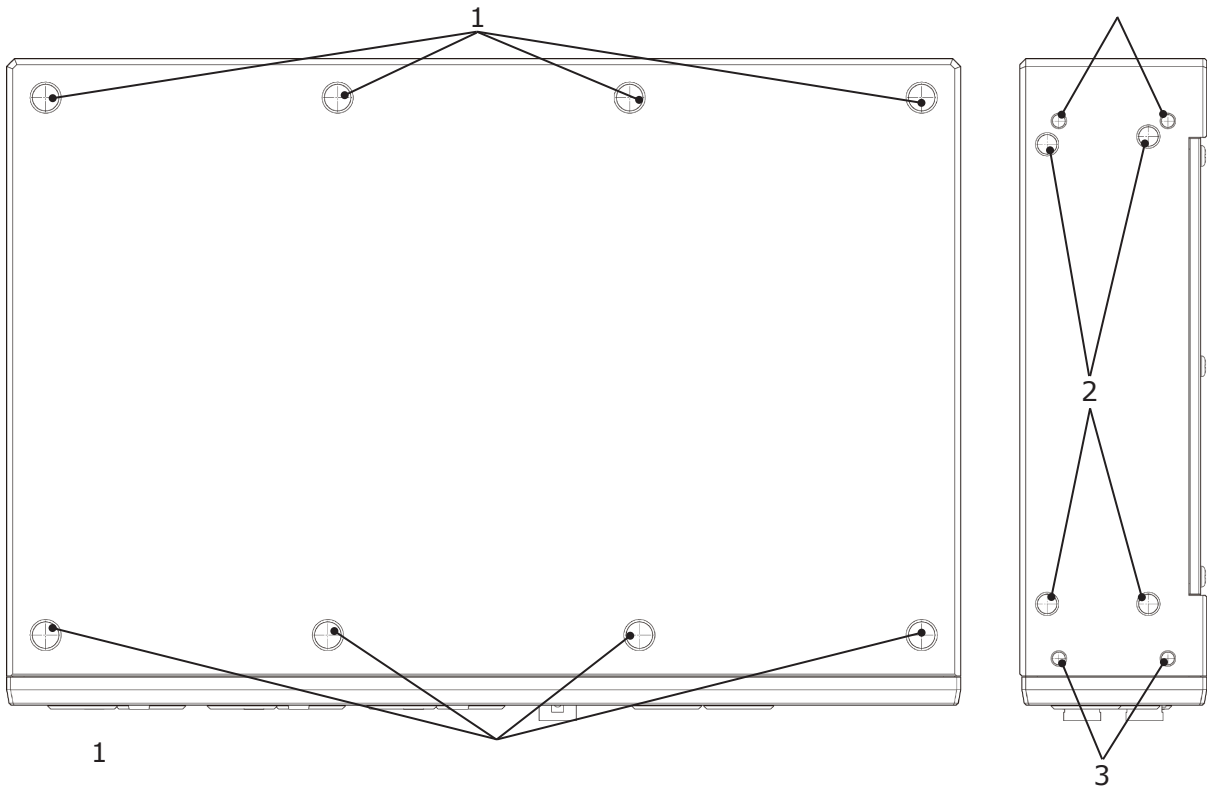


1	Screw holes (4 locations M8 depth 11.5 mm)
2	Screw holes (4 locations M6 depth 8.5 mm)
3	Screw holes (4 locations M4 depth 6 mm)

Attention

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

Left Side, Bottom

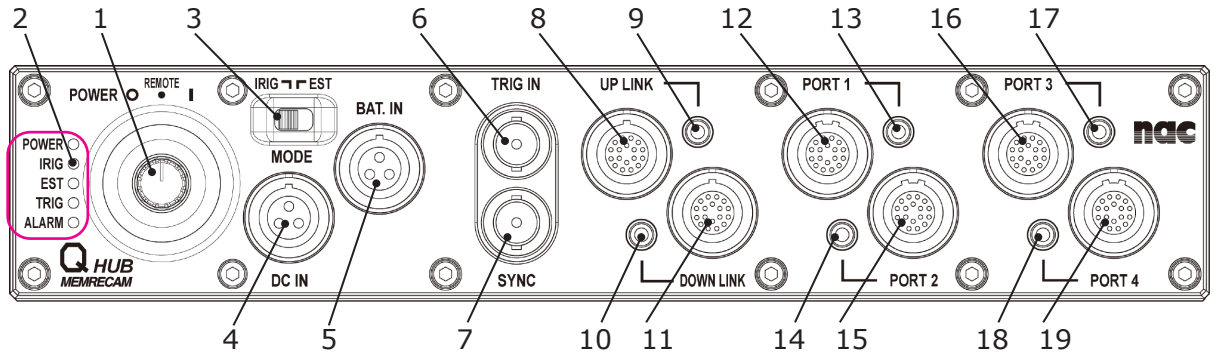


1	Screw holes (8 locations M8 depth 11 mm)
2	Screw holes (4 locations M6 depth 8.5 mm)
3	Screw holes (4 locations M4 depth 6 mm)

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
BAT. IN
TRIG IN
UP LINK
PORT 1
PORT 3
POWER
IRIG
EST
TRIG
ALARM
MODE
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

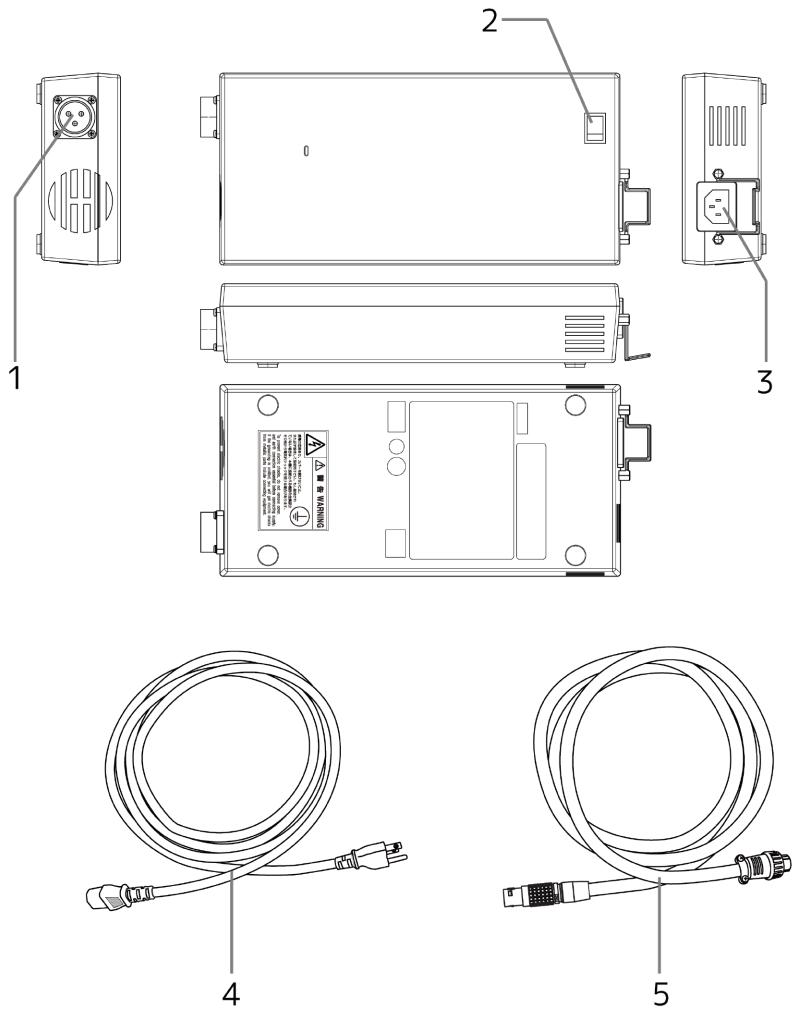
- Do not use screws longer than the depth of the screw holes as this may cause a malfunction.

Status LED

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

LED	LED Status	Operation	⏩🕮
POWER	Lit in green	Power ON	5-15
	Not lit	Power OFF	5-16
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

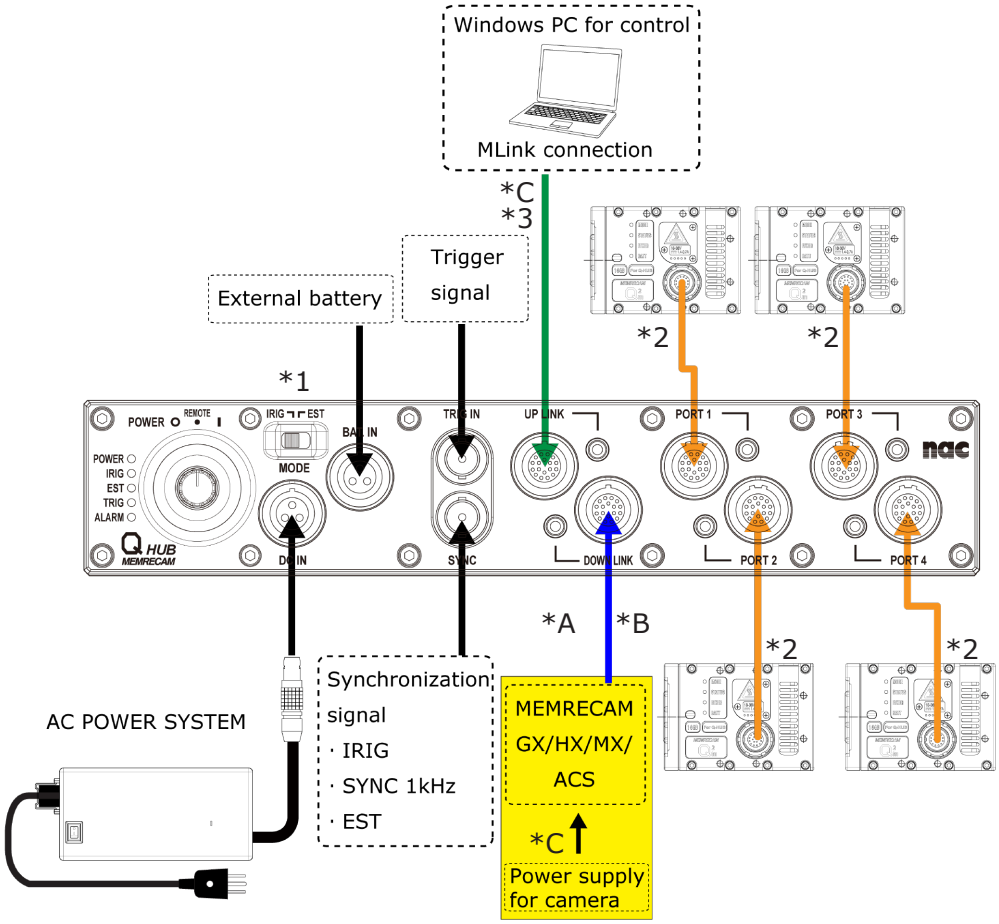
Connector Name	Splitter Connector Name	Input/Output Signal
PORT 1 to 4	—	For Q2m camera connection (*1)
UP LINK	—	Q-HUB, GX-HUBi connection (*2) GX-HUB connection (*3) Windows PC connection for control (*4,5)
	ETHER (*4 or 5)	1000BASE-T Ethernet
	TRIG2 (*5)	External trigger input (TRIG2)
	EST2 (*5)	IRIG-B (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 (for GX-HUB, 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/ACS camera connected into DOWNLINK

*A RequiresTo synch exposure of GX/HX/ACS cameras with Q2m cameras, IRIG-B (AM) has to be input into UPLINK (with J3 cable). 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).

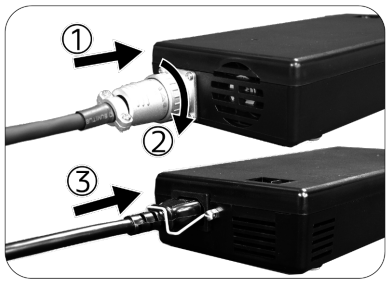
*C To synch exposure of GX/HX/ACS cameras with Q2m cameras, IRIG-B (AM) has to be input into UPLINK (with J3 cable). Or, please perform synchronization in the EST.

When connecting multiple Q-HUBs (🕮 5-17).

■ Connect the Power

1 Turn the power switch OFF.(▸▸🕮 5-9)

- 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.

■ Connect the Q2m

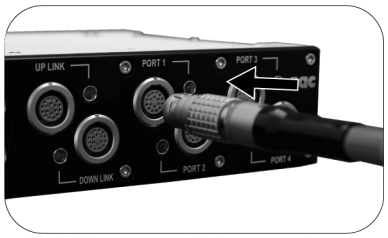
Use the Q-Cam remote cable sold separately and connect the Q2m.

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 Install the locking clip

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



3 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 remote cable plug and plug straight in until a "click" is heard.

CHECK

- The Q2m can also be connected to any of the ports of PORT 1 to 4.

Attention

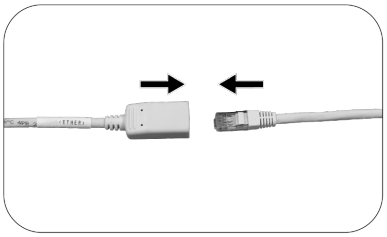
- When unplugging the cable, make sure to turn the power to the Q-HUB.
- The Q-Cam remote cable is designed specifically for the Q2m/Q1m/Q1v and Q5. It cannot be used with the MEMRECAM GX , HX , ACS series.

■ Connect the Windows PC for Control

Use the Ethernet to connect to a PC.

1 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.



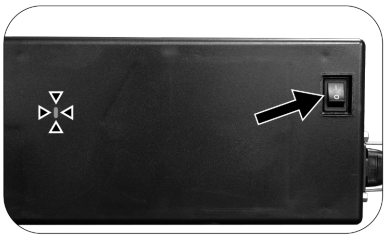
2 Connect the Ethernet cable to the simple J3 cable Ethernet connector. Connect to the Windows PC.

- 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 Q2m 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 Q2m is in the ARM state.

■Turn OFF the Q-HUB Power

1 Disconnect the Mlink and each camera with the Windows PC

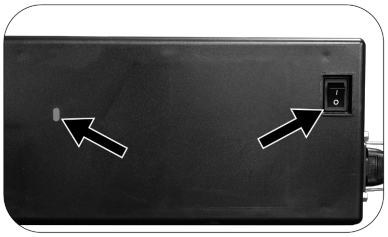
- Save the recorded images required before disconnecting.
- Disconnect the Mlink and each of the cameras.

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 Q2m camera

CHECK

- The Q2m connected to PORT 1~4 can be plugged in and unplugged.
- A power supply for memory backup of Q2m 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

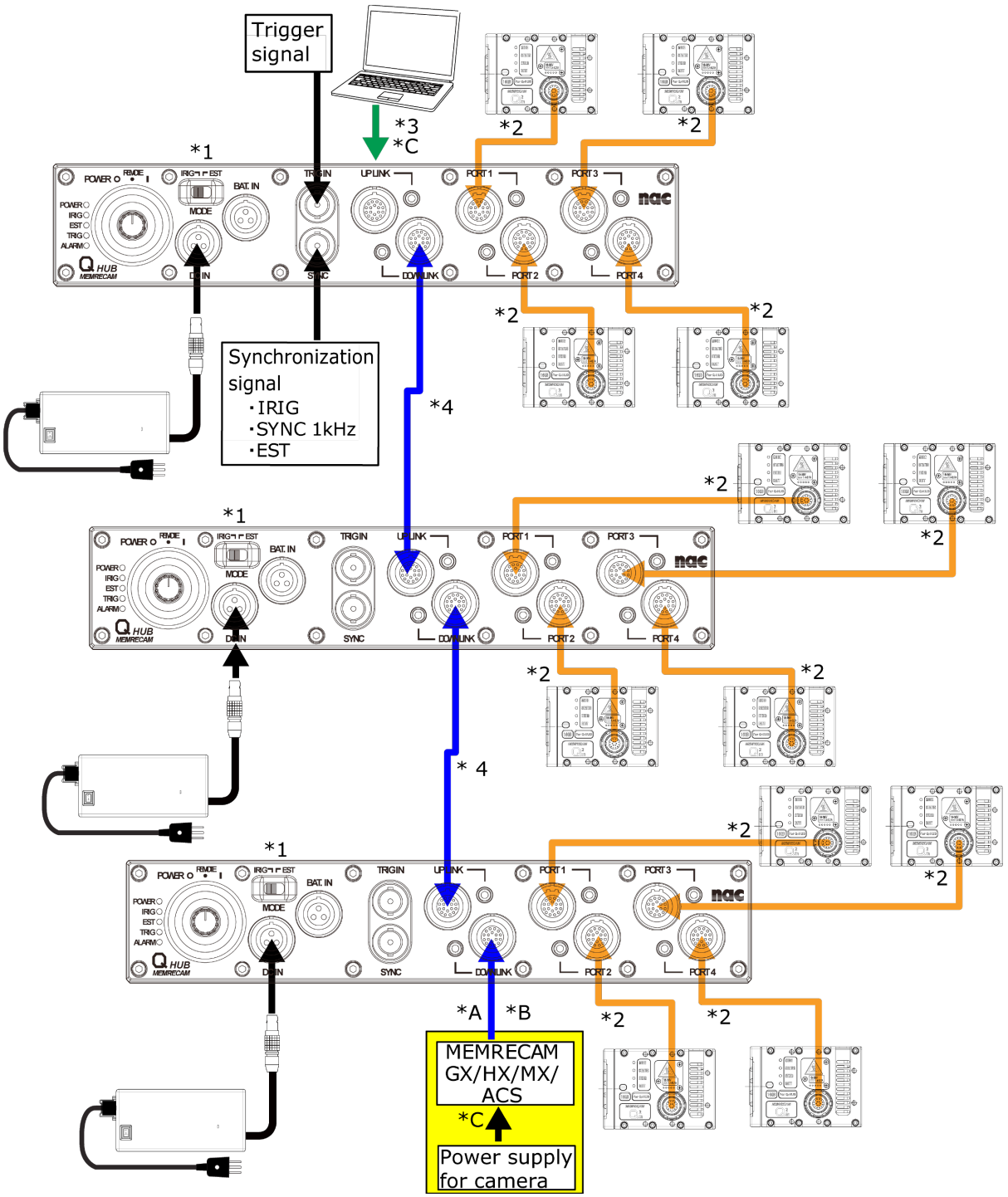
- If the power switch for the AC power system is turned OFF when the Q2m memory backup battery is not charged, the recorded images are deleted from the camera.
- Save the recorded images required to the control PC before disconnecting. See the "Mlink User's Guide" for instructions on how to save.
- Q-HUB 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

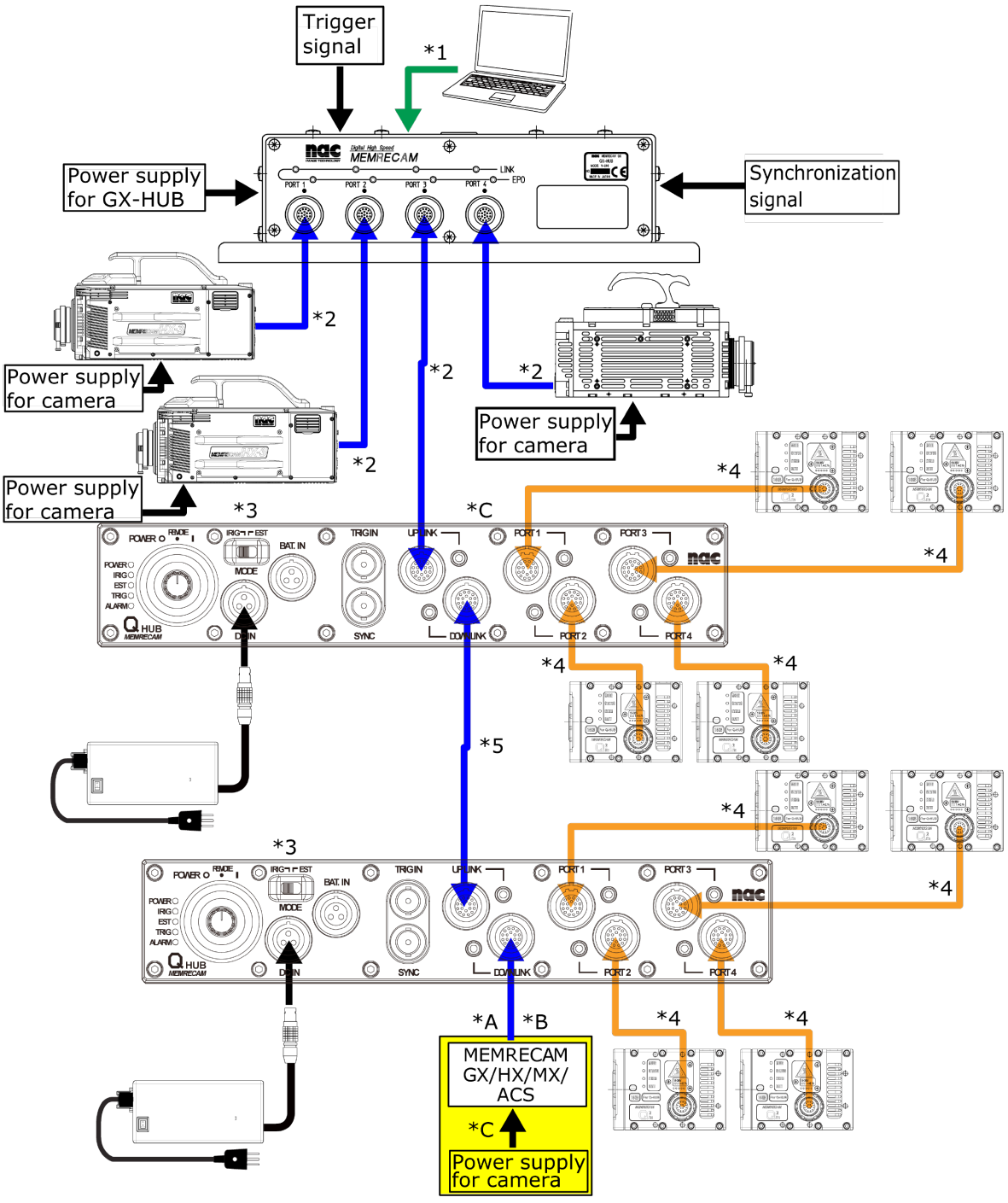


*1 Set synch signal as IRIG when IRIG is in use. Please set it as EST when other signals are in use.
*2 Connect with Q-Cam Remote Cable. Power supplied from Q-HUB
*3 Connect with full or simplified J3 Cable
*4 Connect with GX Remote Cable (for GX-HUBi)

● 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 Q2m 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 Q2m.
	I (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	Green:	Power ON
	Not lit:	Power OFF
IRIG	Green:	Locks in the IRIG B (DCLS, AM) signals or the 1kHz input (Synchronization switch is IRIG)
	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	Green:	Synchronization signal switch set to EST
	Not lit:	Synchronization signal switch set to IRIG
TRIG	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	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

PORT1 to PORT4	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	Up to approx. 140W (By AC POWER SYSTEM, sold separately)	
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

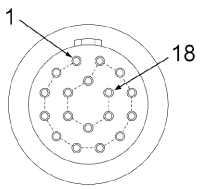
Application	Synchronized signal input
Model	BNC receptacle
Compatible plug	BNC plug
Input	Signal level: TTL level, 5V pull-up resistance 4.7KΩ, Isolation input L level: -0.5VDC (minimum applied voltage) to 0.8VDC H level: 2.0VDC to 5.5VDC (maximum applied voltage) • IRIG B DCLS input • SYNC 1kHz input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



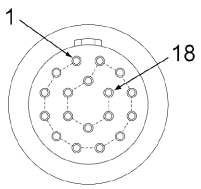
From the connector mating side

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



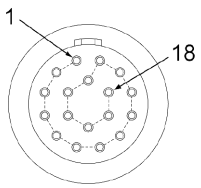
From the connector mating side

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 Q2m 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 power output	Camera power
12	DC OUT RTN	OUT	DC power 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, Dimensional Drawings

■ 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)

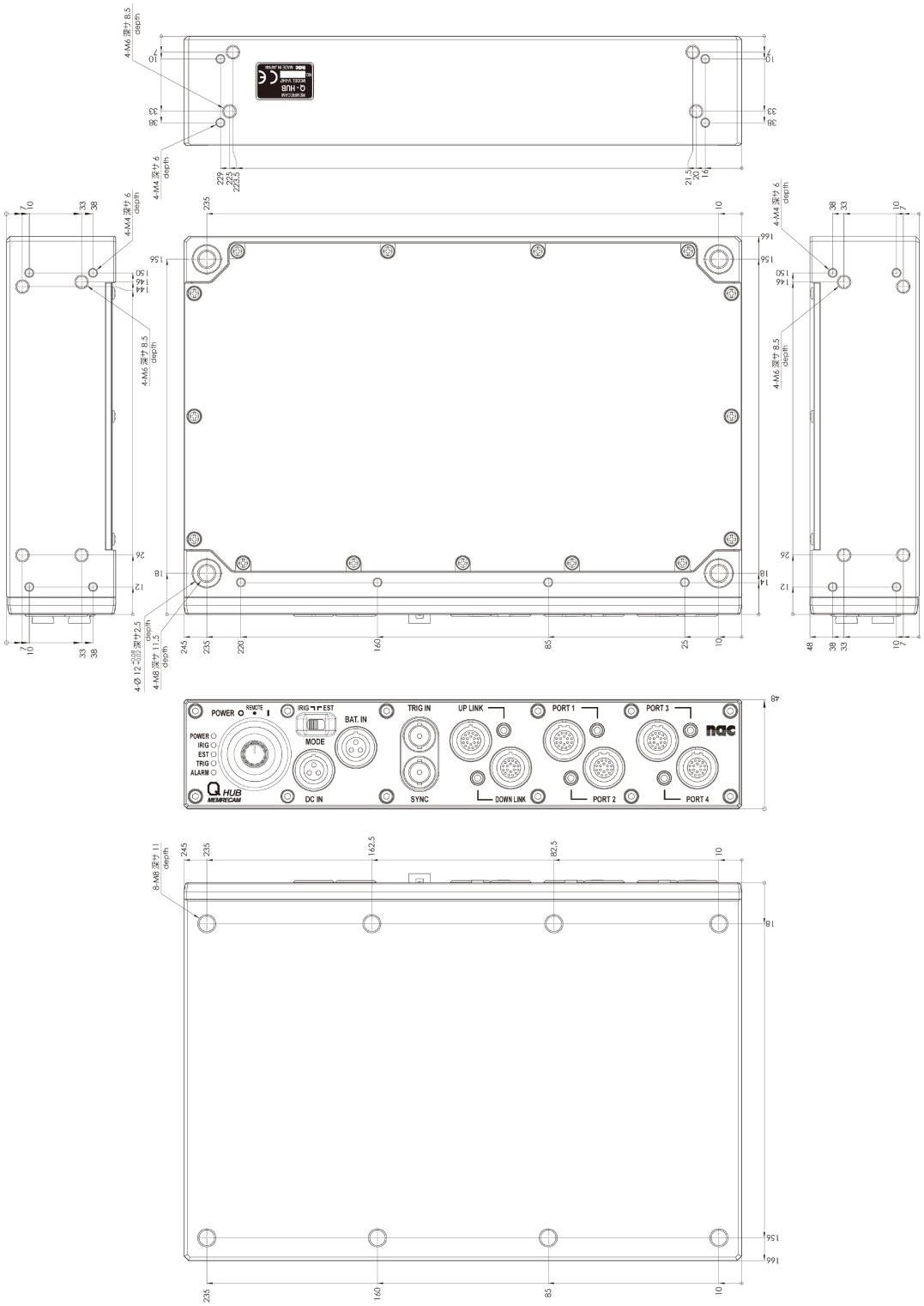
■ Environment

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
Shock	Half-sine, 11msec, 100G, 6 axis total of 1,000 times

■ Application Standards

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

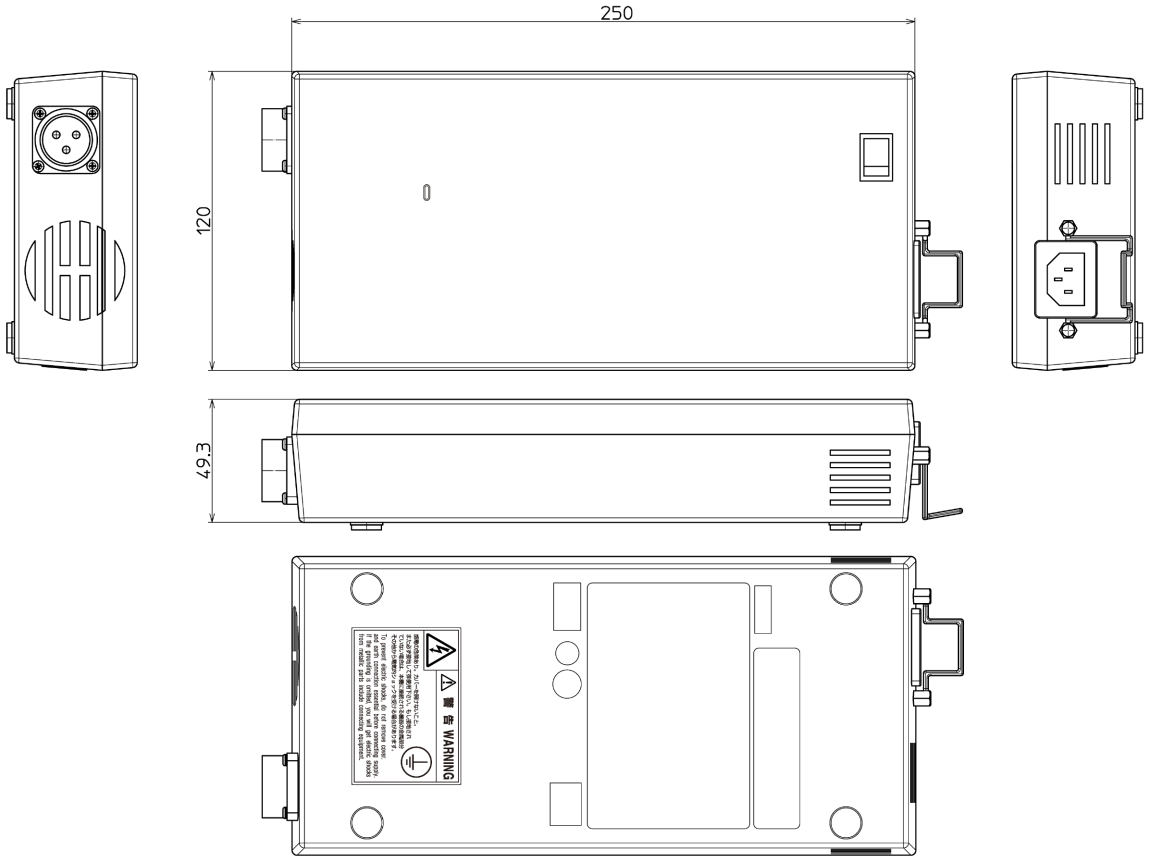
■ Dimensional Drawings



Main Options

■AC POWER SYSTEM

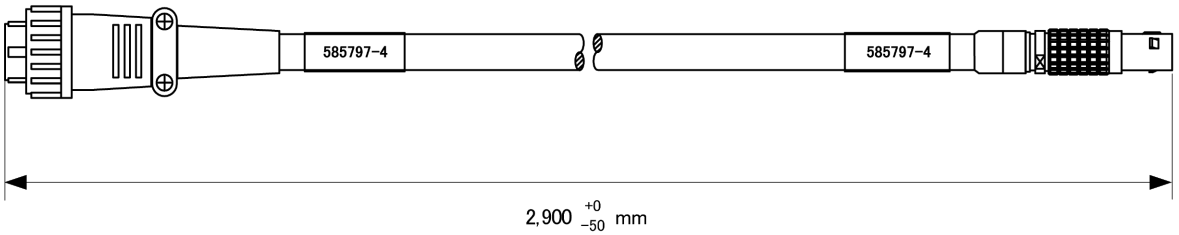
Exterior Dimensions (W×H×D)	About 120 × 49.3 × 250 mm (not including the connector and such)
Weight	About 1.4 Kg
Operating temperature and humidity	0 to 70°C, 5 to 95%RH (no condensation)
Storage temperature and humidity	-40 to 85°C, 5 to 95%RH (no condensation)
Connector	Camera side: NANABOSHI NET-243-RF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



(00477)B

■ 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

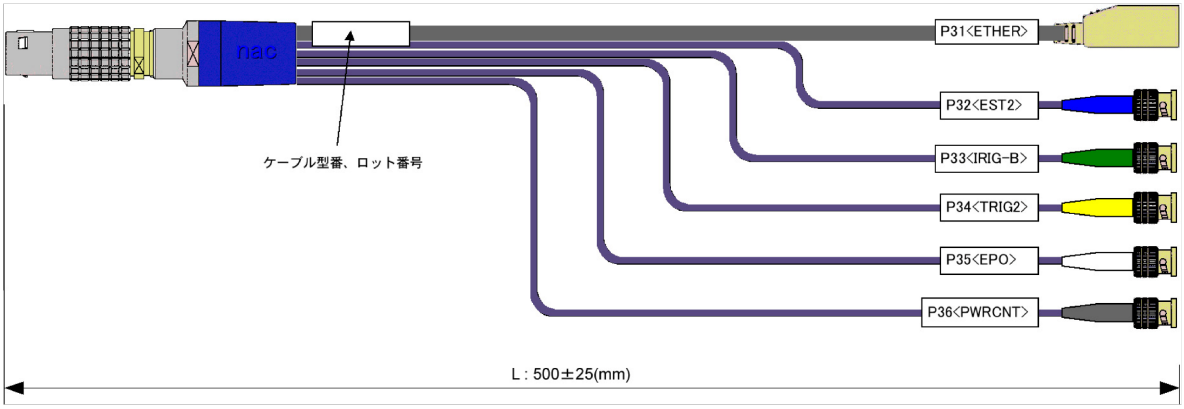


■ Q-Cam Remote

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

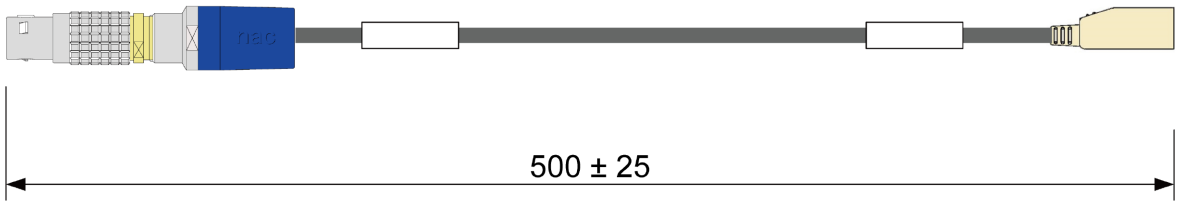
■J3 Splitter Cable

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



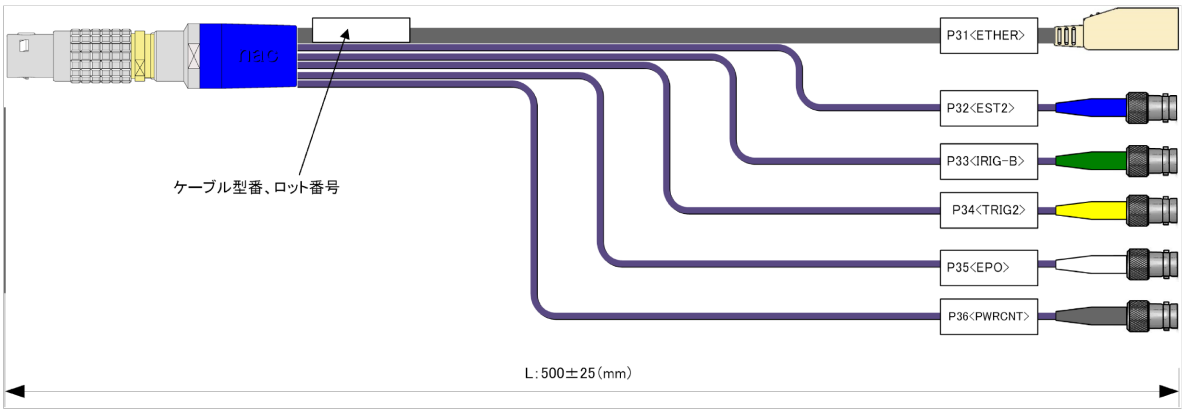
■Simple J3 Cable

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



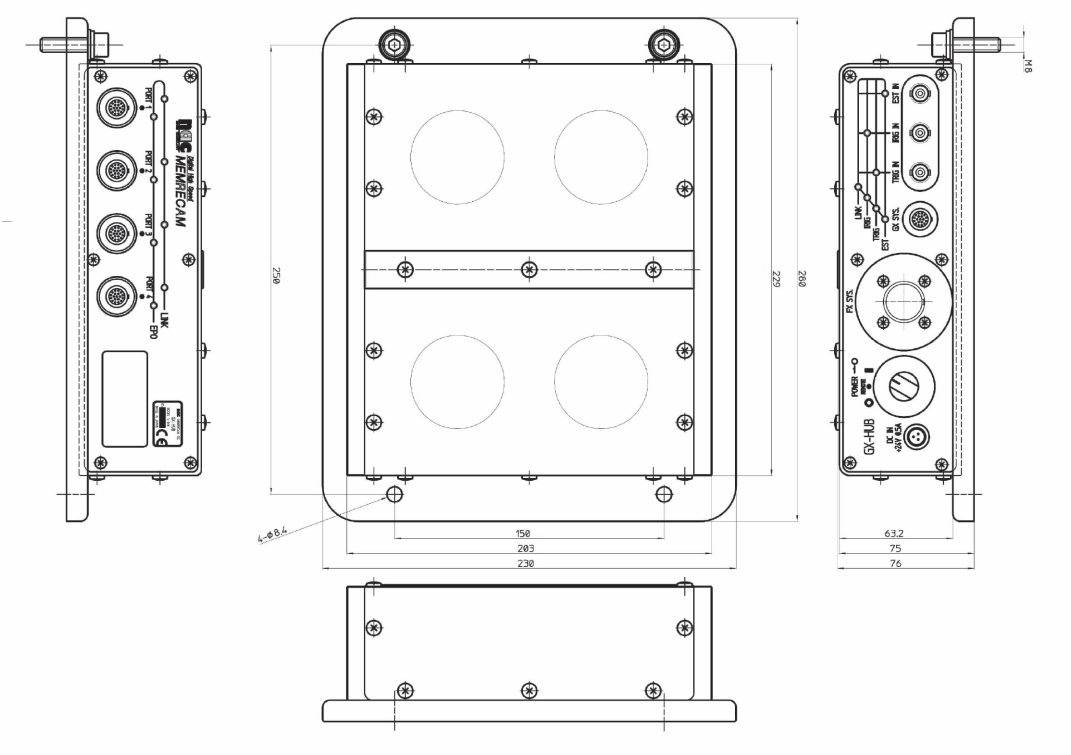
■J3 Splitter Cable

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



■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	
Shock	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 Subpart B Class A, KN32, KN35

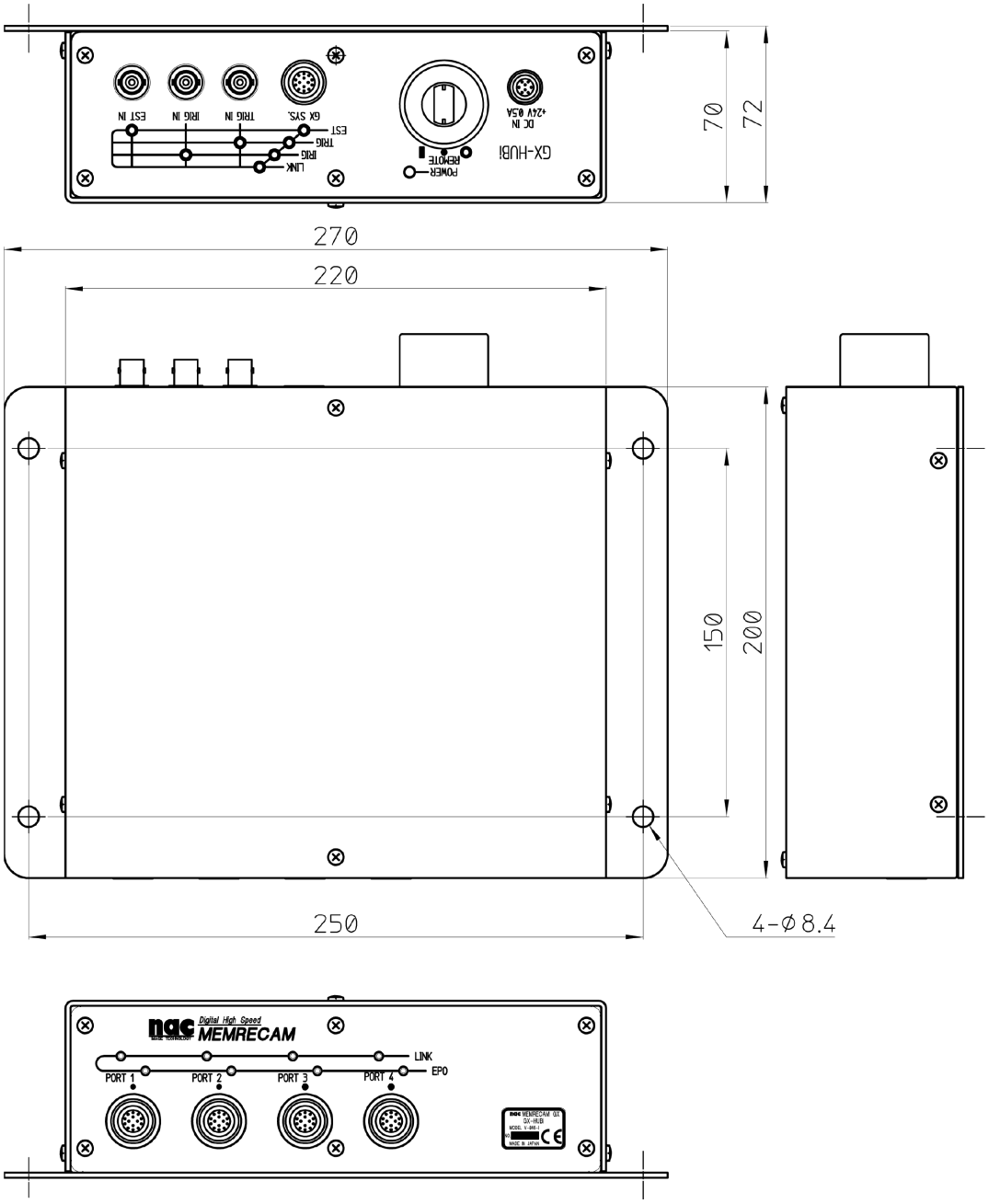


■GX Remote cable (for the GX-HUB)

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 Subpart B Class A


EST IN
TRIG IN
TRIG IN
GX SYS.
EST
TRIG
TRIG
LINK
POWER
REMOTE
GX-HUB1
DC IN
+24V 0.5A
70
72
270
220
150
200
250
4-∅8.4
Digital High Speed
MEMRECAM
LINK
EPO
PORT 1
PORT 2
PORT 3
PORT 4

■ 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

Revision History

Revision	Date of issue	Changes
A	July 2020	First edition
B	May 2021	Compatible with ResQ ADAPTER SYSTEM

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

nac Image Technology Inc.	
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/

nac IMAGE TECHNOLOGY

(00477)B