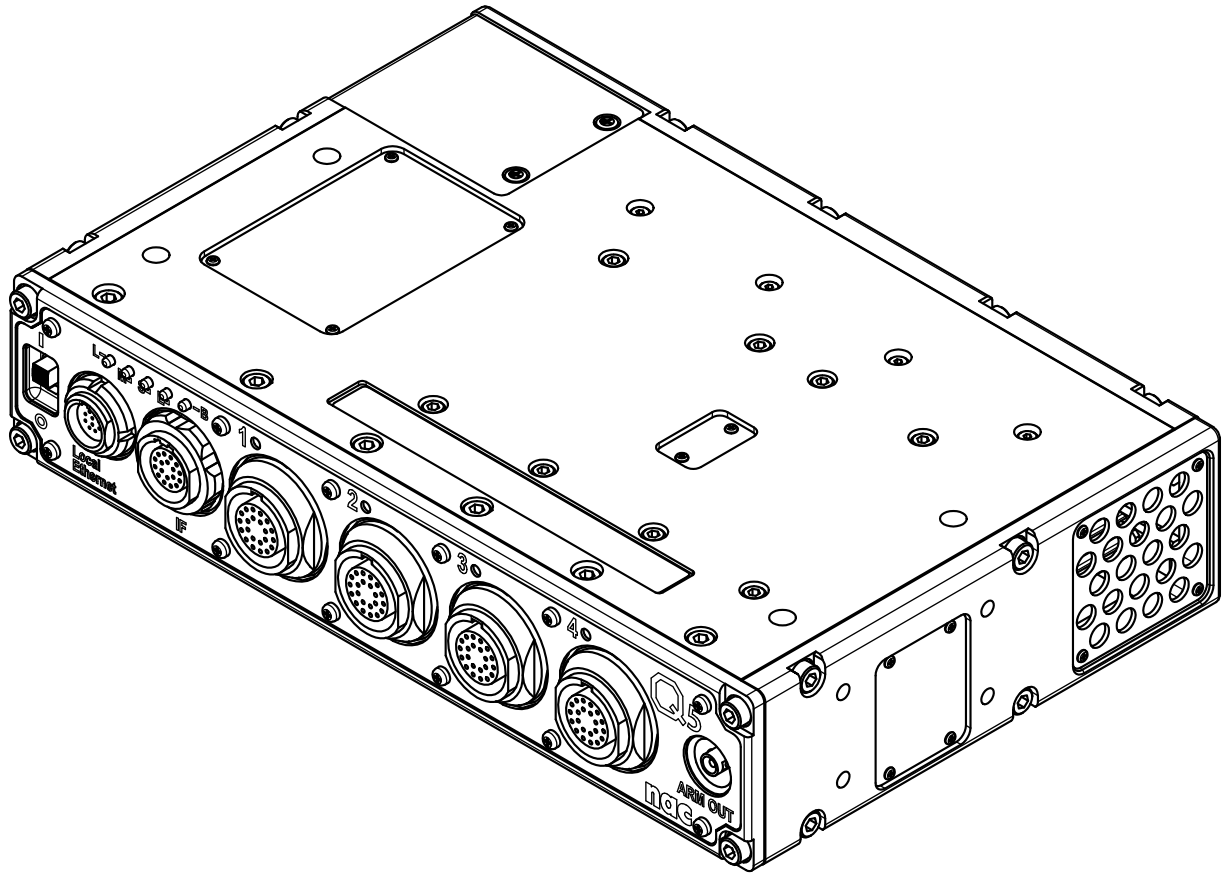
800419-0D

IMAGE TECHNOLOGY



High Speed Camera System

MEMRECAM Q5

Model ST-850

User's Manual

OCT 2020

Read before Use

Information to the User

FCC Information

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

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

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

Product name	Basic Model no.
Q5 DRP	MODEL　V-341
MEMREAM Q-HUB	MODEL　V-847

CE marking

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

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KC marking

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

Product name	Basic Model no.	Cert. no.
Q5 DRP	MODEL　V-341	MSIP-REM-nac-V-341
S2-Cam	MODEL　V-203	MSIP-REM-nac-V-203
GX-HUB	MODEL　V-846	MSIP-REM-nac-V-846
MEMREAM Q-HUB	MODEL　V-847	MSIP-REM-nac-V-847
μ-Cam RELAY BOX	MODEL　V-848	MSIP-REM-nac-V-848
μ-Cam Camera head (Side type)	MODEL　V-1002	MSIP-REM-nac-V-1002

A 급 기기 (업무용 방송통신기자재)

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

Features of This Unit

MEMRECAM Q5 is the camera head that high-speed record under various environment is possible and a high speed camera system of the record part mold release.

Solid ・Compact DRP

Compact・lightweight Q5 DRP（recorder）can fit in various places.

Shock proof performance up to 200G.

Compact・Ultra-compact・Camera Head

Compatible with the 4 existing types of GX-5 camera heads.

・μ-Cam　Ultra-compact（15×16mm^2）

・C-Cam　Ultra sensitive. ISO color 8,000/BW 50,000

・S2-Cam　Compact（25mm^2）

・P2-Cam　Four kinds of pencils type camera varying in a head, the direction of the cable

Superior Performance

High speed photography requiring advanced techniques can be easily performed.

Perform continuous recording to the semiconductor memory or via recording trigger input with confidence that images will not be accidentally lost.

Flexible Image Playback

Slow motion playback of recorded images or repeated playback in a specified range is possible.

Detailed image analysis can be conducted with on a PC.

High-Speed Network Transfer

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

Memory Backup

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

Various External Interfaces

Connect optional 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.

This document includes a description of the Q5 firmware Ver1.34 and HXLink Ver.1.93.

The contents of this document may change without notice.

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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 camera unit dedicated AC adapter on anything other than that specified.**
  (Malfunction or fire may occur.)

⚠ Warnings

Using the Q5 unit

● **Do not disassemble or modify**

(Do not loosen screws on the Q5 unit or open the cover even if the Q5 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.

● **When there was an abnormality, turn off power switch of Q5 and pull the input power supply plug of a power supply cable connected to Q5 or the AC adapter which turned off a power supply**

(If water or other foreign objects get inside, if the exterior breaks due to being dropped, if the Q5 becomes hotter than normal, or if smoke, odors or noises are emitted. The Q5 heats up during operation so this is not a malfunction.)

⇒Contact the store where purchased or our service center.

Confirm the input power (Q5 unit)

● **Check the input power before connecting.**

- During AC adapter use : AC100～240V/47～63Hz
- During DC power connection : DC20～32V

(Malfunction, electrical shock or fire may occur if connected to the wrong power supply.)

⚠ Warnings

Using the camera head

●**Do not disassemble or modify**

（Do not loosen screws on the camera head or open the cover even if the camera head 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 leave the camera cable connected when the Q5 is still powered**

(Malfunction may occur.)

⇒ Contact the store where purchased for inspection ・maintenance ・repair.

● **When there was an abnormality, turn off power switch of Q5 and pull the input power supply plug of a power supply cable connected to Q5 or the AC adapter which turned off a power supply**

(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 heats up during operation so this is not a malfunction.)

⇒ Contact the store where purchased or our service center.

⚠ Warnings

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 modify**

(Do not loosen screws on the AC adapter or open the cover even if the AC adapter 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.

- **When there was an abnormality, turn off the power switch of the AC adapter and pull an input power supply plug**

(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.)

⇒ Contact the store where purchased or our service center.

⚠ Caution

Using the Q5 unit

● **Do not interfere with the release of heat from the Q5**

(The Q5 has a cooling fan. 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 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.)

● **Check the ambient temperature of the location where used and stored.**

- Use temperature range : 0～40℃, humidity 30～80%RH, no condensation
- Storage temperature range : -10～60℃, humidity 20～80%RH, no condensation

Using the camera head

● **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 head is removed. If fingers or items are placed inside, the sensor may become scratched or dirty so the image quality may be adversely affected.)

⇒ Contact the store where purchased for inspection ・maintenance ・repair.

● **Do not place heavy items on the camera head**

(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.)

● **Check the ambient temperature of the location where used and stored**

- Use temperature range : 0～40℃, humidity 30～80%RH, no condensation
- Storage temperature range : -10～60℃, humidity 20～80%RH, no condensation

Using the Battery (Q5)

● **Do not leave the camera in locations with high temperatures, such as in closed vehicles, near flame, or on top of stoves**

(The Q5 has a memory backup battery which may cause the battery to leak or reduce the battery performance or life.)

⚠ Caution

Handling while moving or transporting

● **Use the dedicated storage case for moving or transporting this device**
(To protect the Q5 from malfunction, use the optional dedicated storage case for transport.)

Using the AC Adapter (for the Q5)

● **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 AC100～240V, 47～63Hz 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：0～60℃, humidity 5～95%RH, no condensation
- Temperature range for storage：-40～85℃, humidity 5～95%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　(for the 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 AC100～240V, 47～63Hz 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：0～70℃, humidity 5～95%RH, no condensation
- Temperature range for storage：-40～85℃, humidity 5～95%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 Q-HUB main unit or camera.)

Handling when moving or transporting the AC adapter

● **Turn off the power and unplug the connected cables**

(Make sure the power is turned off and the cables unplugged when moving the AC adapter. Fire, electrical shock or malfunction may be caused.)

In addition to that mentioned above, unexpected problems may occur depending on the conditions of use of this device. Therefore, carefully read the various items mentioned in this manual as well as in the user's guide for peripheral devices (or user's manual) before using. Also, 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.

Regular Replacement of Parts

・Q5 Memory Backup Battery

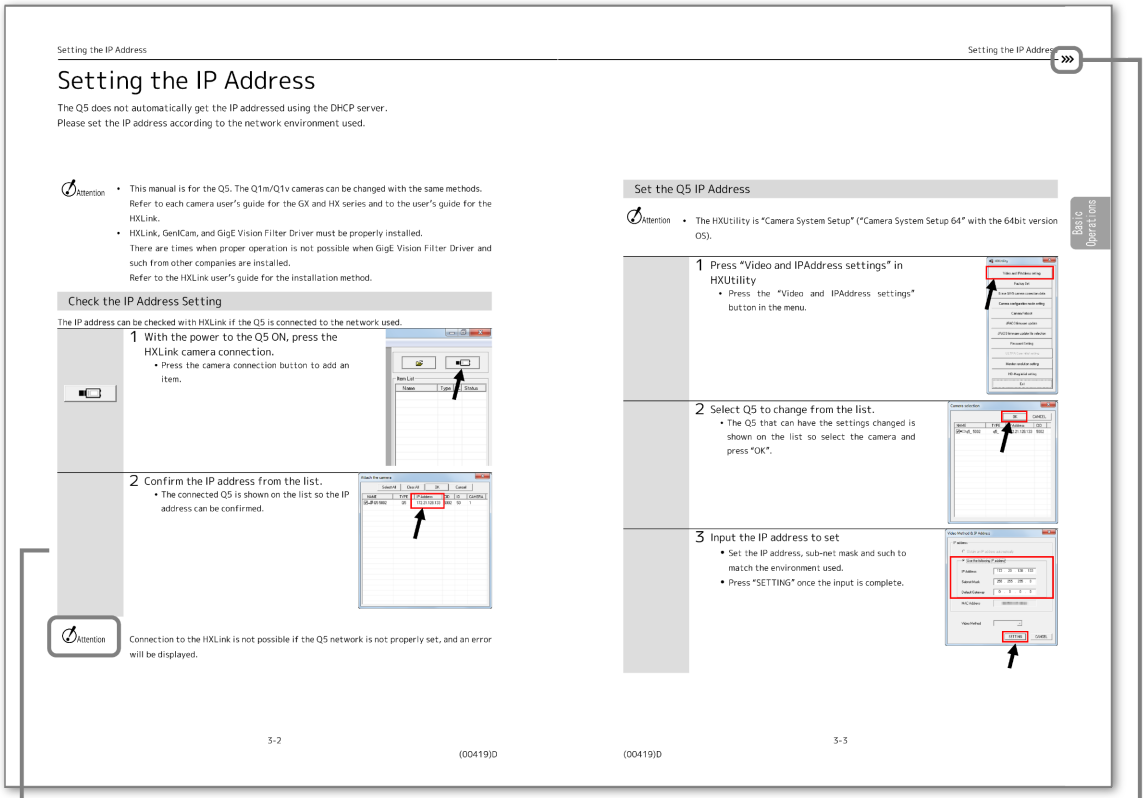
In general, replace the memory backup battery one year after purchase. However, if there is a rapid loss of charge or problems during use, replace immediately. Replacement cannot be performed by users so contact your store or our service center.

Warranty

The warranty is valid for one year after purchase.

Refer to the attached warranty for details.

This Booklet



Setting the IP Address

Setting the IP Address

The Q5 does not automatically get the IP addressed using the DHCP server.
Please set the IP address according to the network environment used.

Attention
- This manual is for the Q5. The Q1m/Q1v cameras can be changed with the same methods. Refer to each camera user's guide for the GX and HX series and to the user's guide for the HXLink.
- HXLink, GenICam, and GigE Vision Filter Driver must be properly installed. There are times when proper operation is not possible when GigE Vision Filter Driver and such from other companies are installed. Refer to the HXLink user's guide for the installation method.

Check the IP Address Setting

The IP address can be checked with HXLink if the Q5 is connected to the network used.

1 With the power to the Q5 ON, press the HXLink camera connection.
- Press the camera connection button to add an item.

2 Confirm the IP address from the list.
- The connected Q5 is shown on the list so the IP address can be confirmed.

Attention
Connection to the HXLink is not possible if the Q5 network is not properly set, and an error will be displayed.

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Setting the IP Address

Set the Q5 IP Address

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

1 Press "Video and IPAddress settings" in HXUtility
- Press the "Video and IPAddress settings" button in the menu.

2 Select Q5 to change from the list.
- The Q5 that can have the settings changed is shown on the list so select the camera and press "OK".

3 Input the IP address to set
- Set the IP address, sub-net mask and such to match the environment used.
- Press "SETTING" once the input is complete.

Basic Operations

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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".

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1 Introduction

2 Preparations

3 Basic Operations

4 Specifications

5 Options

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6 Q-HUB

7 Q-HUB BATTERY PACK

8 Contact

1

Introduction

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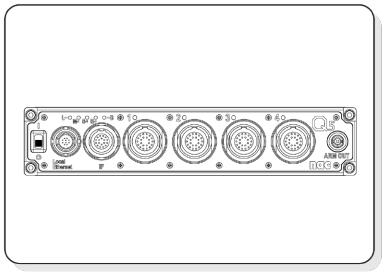
Verify the Standard Components

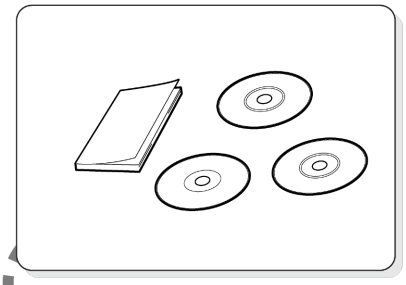
The following are included as standard components of the Q5 DRP.



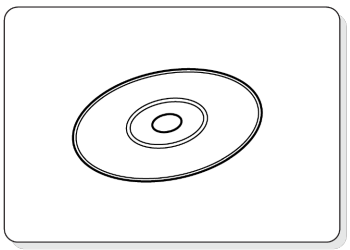
● Q5 DRP

- Q5 DRP : Q5 DRP main unit

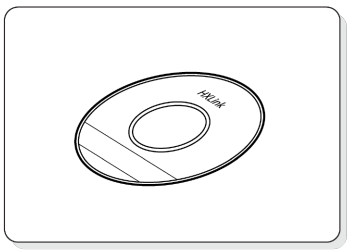
CHECK
- DRP is an abbreviated designation of "Data Recording Processer".



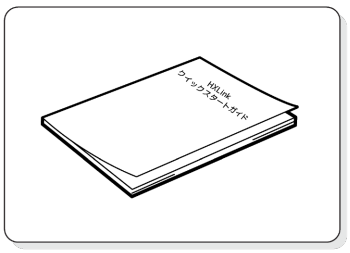
● Q5 DRP KIT



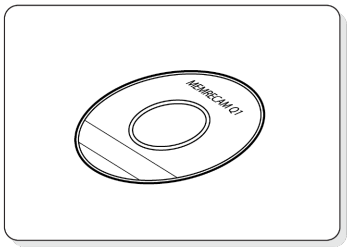
● HXLink CD-ROM



● HXLink User’ s Guide CD-ROM
(Detailed digital user’ s guide)



● HXLink
Quick Start Guide



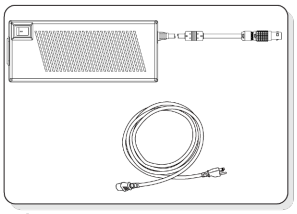
● Q5 User’ s Guide CD-ROM
(Digital user’ s guide)

- Q5 DRP KIT : Q5 PC control software and user’s manual
  - HXLink CD-ROM : PC control software CD-ROM (for install)
  - HXLink User’s Guide CD-ROM : Detailed digital user’s guide for the HXLink
  - HXLink Quick Start Guide : Simple user’s guide for the HXLink
  - Q5 User’s Guide CD-ROM : Digital user’s guide for the Q5 (this guide)

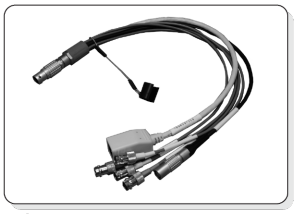
CHECK • Operate the Q5 using HXLink. See the HXLink User’s Guide for the HXLink operating method.

Main Options

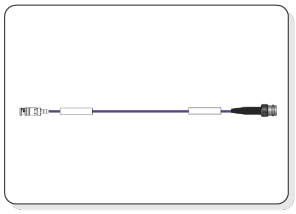
The MEMRECAM Q5 main options are as follows.



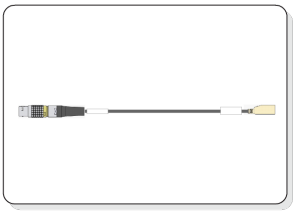
● MINI AC POWER SYSTEM



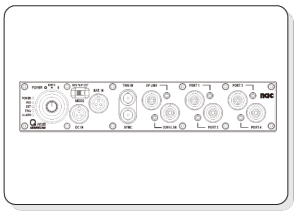
● Q-Cam Cable



● ARMOUT Cable



● LOCAL ETHER Cable



● Q-HUB

- MINI AC POWER SYSTEM : Dedicated AC adapter, AC power cable set
- Q-Cam Cable : Dedicated input/output cable for the Q5, Q1m/Q1v and Q-HUB
- ARMOUT Cable : Dedicated ARMOUT connector output cable for the Q5
- LOCAL ETHER Cable : Dedicated LOCAL ETHERNET connector cable for the Q5
- Q-HUB : Connect two Q5 for synchronous filming.

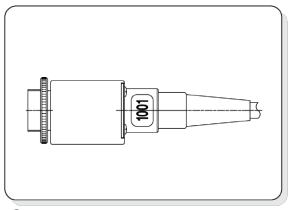
Attention
- This guide is used for the aforementioned options. Purchase if necessary.
- Do not use the Q-Cam cables with the MEMRECAM HX or GX series.
- Refer to the separate page (⏭🕮 6-2) for the Q-HUB.

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

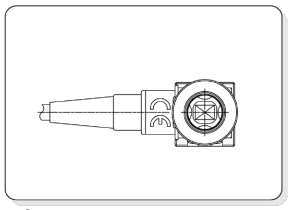
Optional Cameras

The MEMRECAM Q5 can be connected to 4 types of optional cameras. Use a camera that fits the filming application.

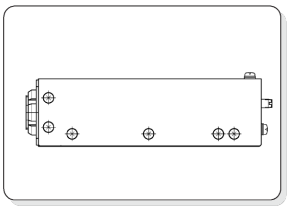
μ-Cam



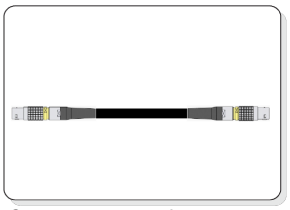
● Camera head
Straight



● Camera head
Side

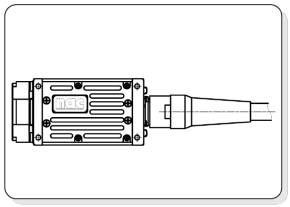


● RELAY BOX

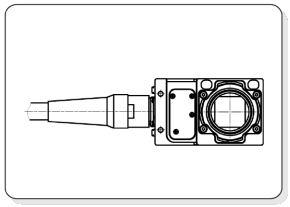


● HR-Cam Cable

C-Cam

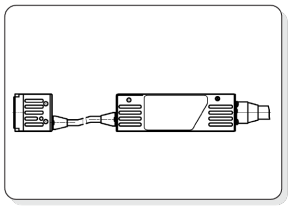


● Straight

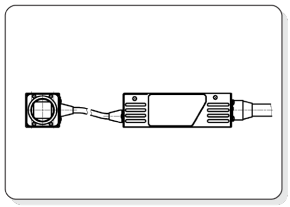


● Side

S2-Cam

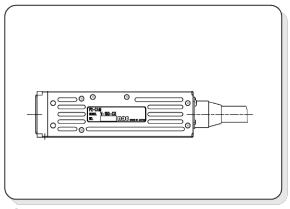


● Straight

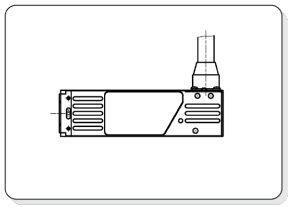


● Side

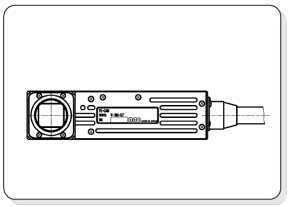
P2-Cam



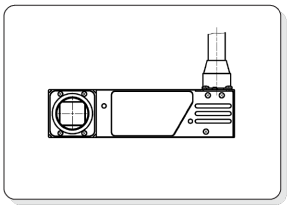
● SS



● SA



● AS



● AA

μ-Cam　Remote type ultra-compact camera. Combination of the camera head, RELAY BOX and HR-Cam cable.

- Straight／Side：　Ultra-compact camera head
- RELAY BOX：　Transmits camera head image signals to the Q5.
- HR-Cam Cable　Connects the RELAY BOX and the Q5

Attention
- The μ-Cam does not work with just the camera head. Make sure to use together with the RELAY BOX and HR-Cam Cable.

C-Cam　Ultra-sensitive camera.

- Straight／Side：　Camera head

S2-Cam　Remote type camera head.

- Straight／Side：　Camera head

P2-Cam　Pencil type camera head

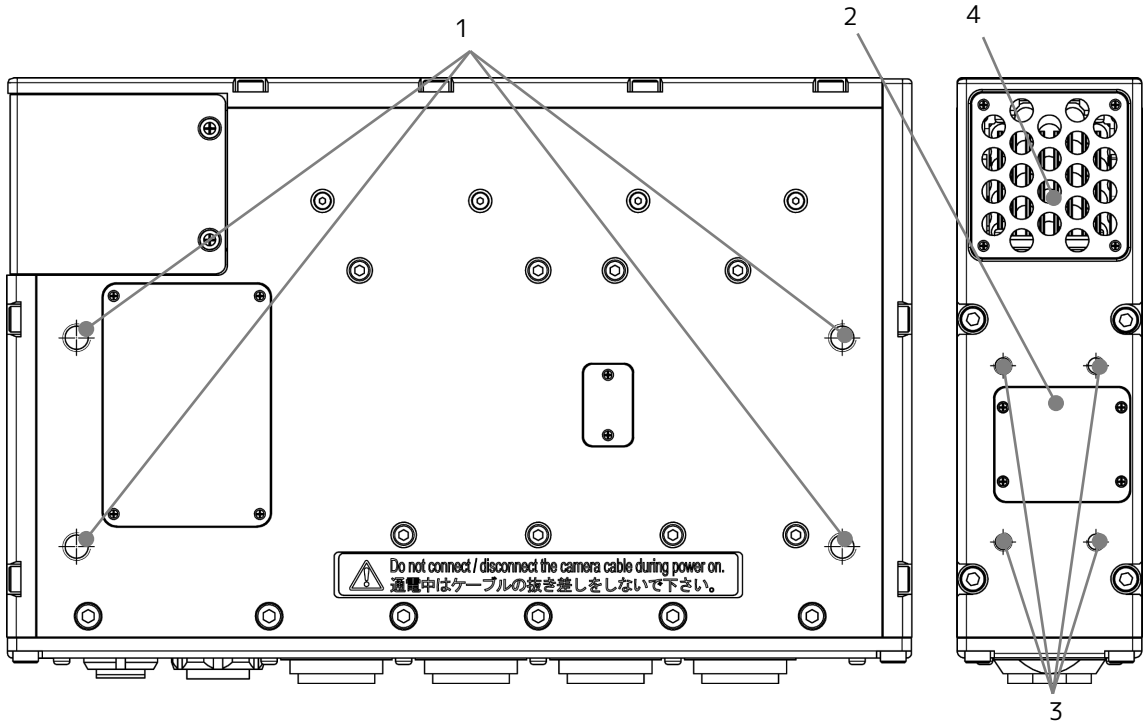
- SS：　S (Straight) head－ S (Straight) cable type
- SA：　S (Straight) head－ A (Angle) cable type
- AS：　A (Angle) head　－ S (Straight) cable type
- SS：　A (Angle) head　－ A (Angle) cable type

CHECK
- These camera heads are options that are also options for the MEMRECAM GX-5/GX-5F.

External Appearance and Names for the Parts

External Appearance and Names for the Main Unit

Top side, right side



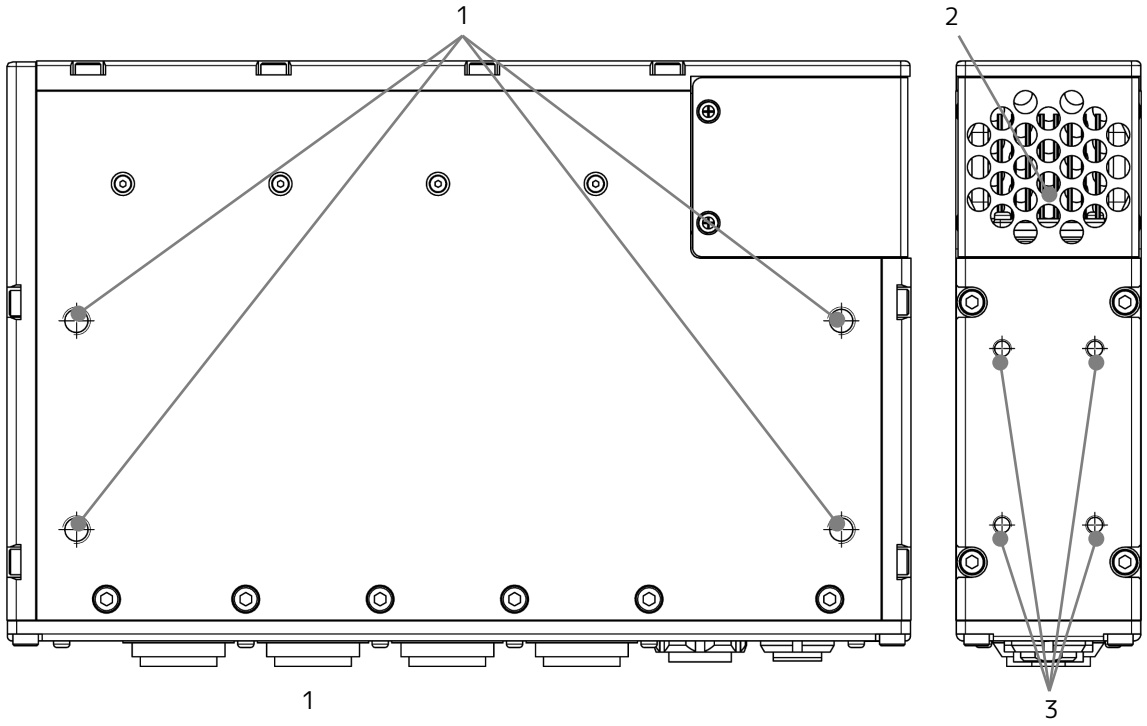
1 Screw openings（4 M6　8mm deep）

2 ResQ connector

3 Screw openings（4 M4　6mm deep）

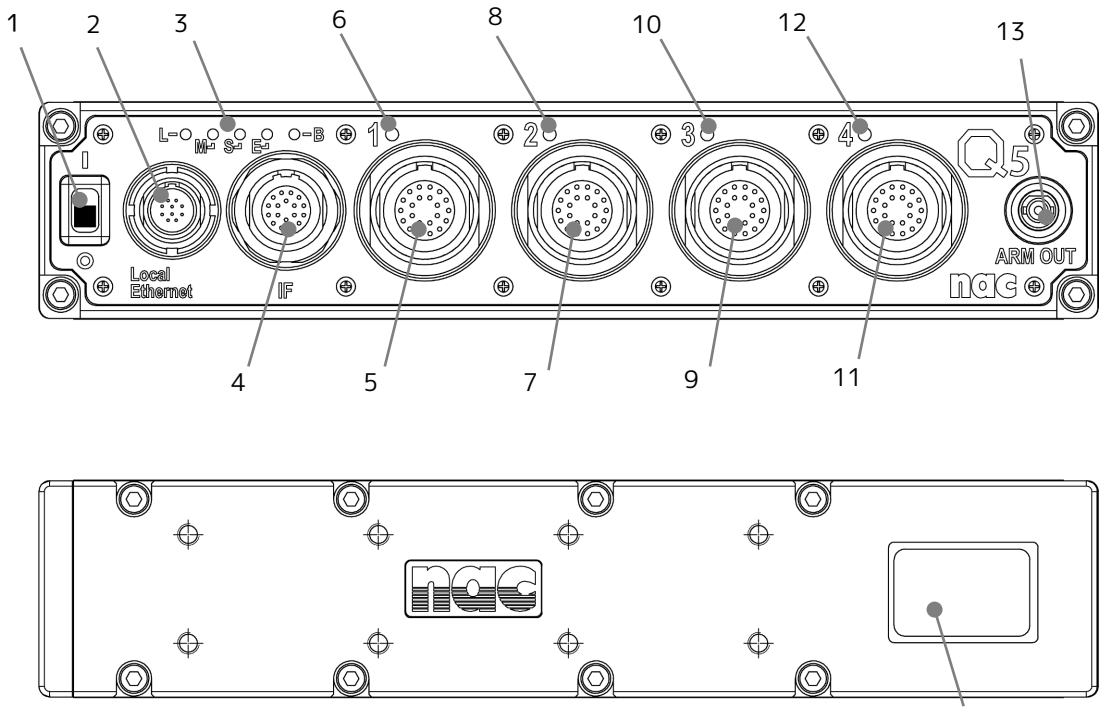
4 Exhaust Vents

Left side, bottom side



1. Screw openings（4　M6　8mm deep）
2. Intake vents
3. Screw openings（4　M4　6mm deep）

Front, Back



1 Power switch
2 Local Ethernet connector
3 Status LED
4 IF connector
5 PORT1 connector
6 PORT1 LED
7 PROT2 connector
8 PORT2 LED
9 PORT3 connector
10 PORT3 LED
11 PORT4 connector
12 PORT4 LED
13 ARM OUT connector
14 Product name plate (shows the product number)

Status LED

The 5 status LED show the status of the Q5.

L (LOCAL ETHERNET)	Shows the local ether cable connection status
M (MODE)	Shows the Q5 mode status
S (STATUS)	Shows the power ON/OFF, file status
E (ETHER)	Shows the ethernet connection status
B (BATT)	Shows the memory backup status and the thermal shutdown status

CHECK

- The thermal shutdown is a function that automatically turns the power OFF when the internal temperature of the Q5 rises to above a set temperature (The power switch of Q5 becomes invalid then).
- When thermal shut down occurs, please return in the following procedures.

1. Turn off the power switch of the AC adapter. When it connects Q5 to Q-HUB, please turn off a power supply of Q-HUB.
2. Turn off power switch of Q5.
3. Turn on the power switch of the AC adapter. When it connects Q5 to Q-HUB, turn on a power supply of Q-HUB.
4. Turn on power switch of Q5.

LED	LED Status	Operation	▸▸🕮
L (LOCAL ETHER)	Lit green	The local Ethernet cable is connected	
	Not lit	The local Ethernet cable is not connected. Or the power is OFF	
M (MODE)	Orange (REC)	REC mode (camera image output, camera image memory recording after trigger detection)	
	Blue (STOP)	STOP/READY mode (memory image output. Playback mode or transfer mode after startup)	
	White (VIEW)	VIEW mode (camera image output, saves recorded contents in the memory)	
	Magenta (ARM)	ARM mode (camera image output, destroys recorded contents in the memory, records new camera image in the memory)	
	Not lit	Power OFF. Or starting up	
	Flashing (EST)	Set to EST mode, and EST pulse is input. Only in VIEW, ARM, REC mode.	
S (STATUS)	Lit green	Normal status	
	Lit red	File status (Abnormal power voltage detected)	
	Flashing red	File status (Elevated Q5 DRP internal temperature detected) ・Flashing slowly Warning temperature ・Flashing quickly Danger temperature	
	Not lit	Power OFF. Or starting up	
E (ETHER)	Flashing green	Network communication with 100BASE-TX	
	Lit orange	Network communication with 1000BASE-T	
	Not lit	Not connected to the network via IF connector. During connection or a power supply is OFF with a local ether cable.	

LED	LED Status	Operation	⏩🕮
B (BATT)	Lit green	Backing up with external power (Battery charge H)	
	Flashing green	Backing up with battery (Battery charge H)	
	Lit orange	Backing up with external power (Battery charge M)	
	Flashing orange	Backing up with battery (Battery charge M)	
	Lit red	Backing up with external power (Battery charge L)	
	Flashing red	Backing up with battery (Battery charge L)	
	Not lit	Memory backup is OFF	
	Lit green	Backing up with external power (Battery charge H)	

PORT LED

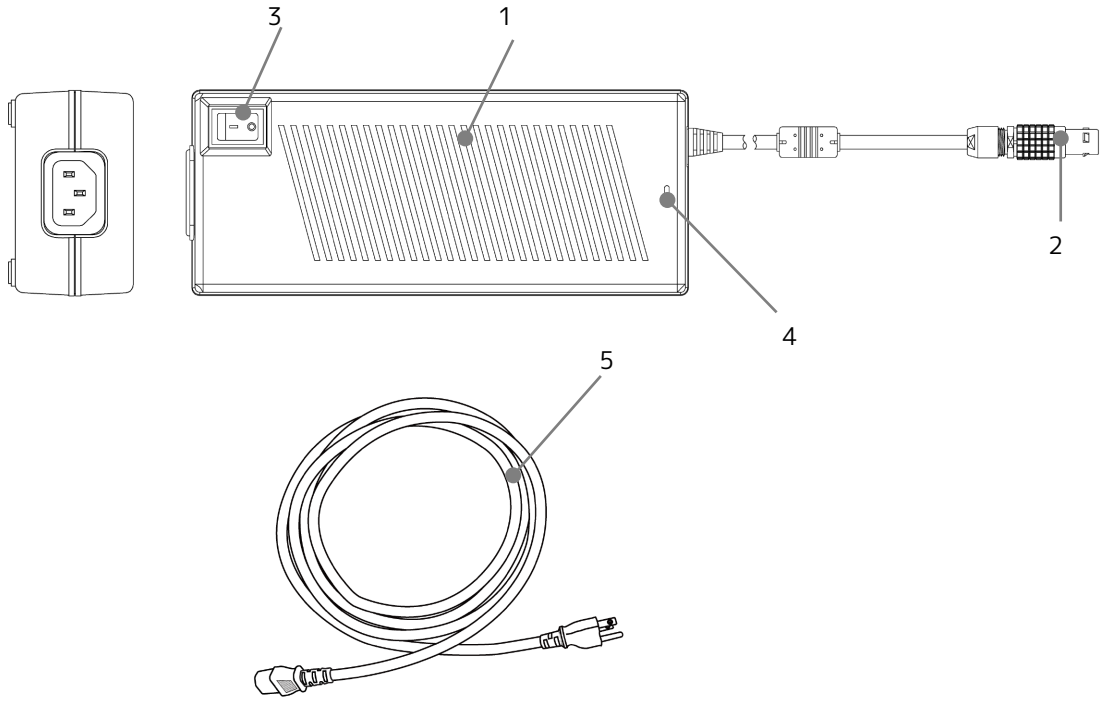
The LED for each camera PORT shows the connection status for the camera head.

LED display color, lit state	Filming Possible?	Camera Head Operation	Port Status (Setting)
Not lit	−	Before operation	−
Flashing green (Fast)	−	Starting up	−
Flashing orange (Slow)	△	Usable	Invalid
Flashing orange (Fast)	×	Not connected	Valid
Lit orange	×	Not connected	Invalid
Lit green	○	Usable	Valid
Flashing red (Fast)	×	Not usable	Valid
Lit red	×	Not usable	Invalid

CHECK

- With a lit state where the filming possibility is "△", it is possible to use the camera connected if the camera configuration is set.

MINI AC POWER SYSTEM

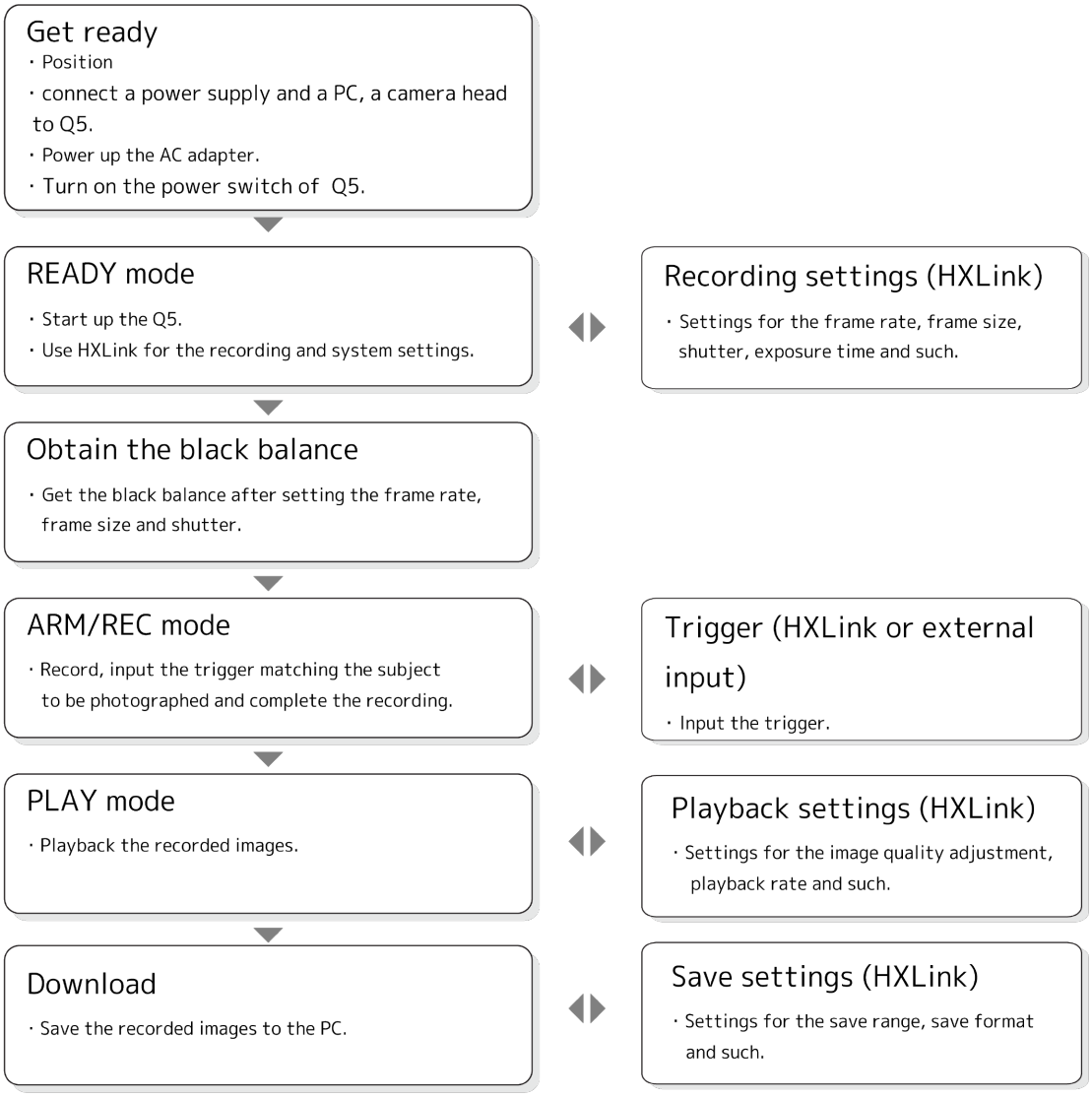


1 AC adapter ▸▸🕮 2-6
2 DC connector ▸▸🕮 2-6
3 Power switch ▸▸🕮 2-15
4 LED
5 AC cable ▸▸🕮 2-6

Flow of Operations

Q5 is operated with the Windows control software HXLink.

The flow for basic recording, playback and storage on this device is shown in the following figure.



CHECK • Read the “HXLink User’s Guide” for the HXLink control software.

2

Preparations

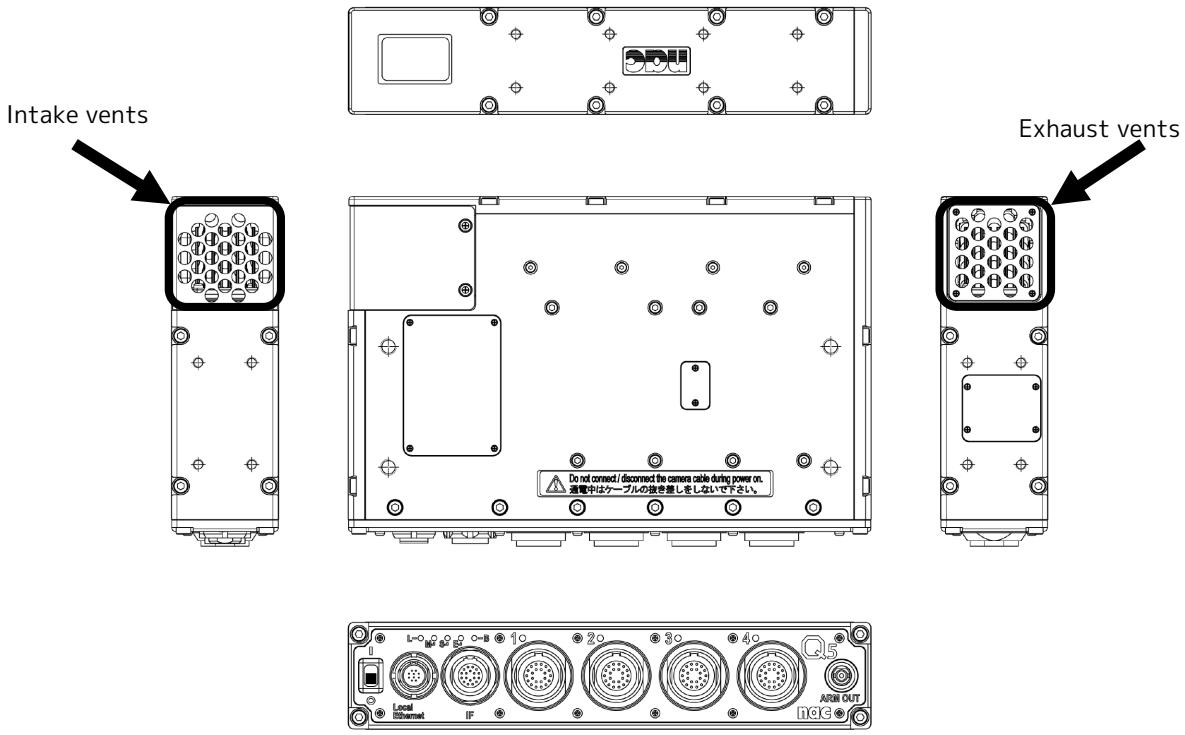
(00419)D

Set Up This Unit

This describes the method of setting　the MEMRECAM Q5.

Mounting the Q5

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



Arrows indicate air vents

Connect the Equipment and Cables

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

Input/Output Connectors

Table of Input/Output Connectors

Connector	Branched Connector	Input/Output Signal
Local Ethernet (※1)	-	1000BASE-T Ethernet
IF (※2) (※3)	DC IN	Power input
	ETHER	1000BASE-T Ethernet
	SYNC IN	Exposure start signal (EST) Synchronous signal (SYNC 1kHz, continuous synchronous pulse) Timed synchronous signal (IRIG-B DCLS) input
	SYNC OUT	IRIG output／SYNC 1kHz output／THRU (thru) output／EPO output /ARM status output
	PWRCTL	Power control input
	TRIG IN	Trigger signal input
PORT1 ~ PORT4 (※4)	-	Camera connection connector
ARM OUT (※5)	-	ARM status output

※1　LOCAL ETHER cable (option) required.

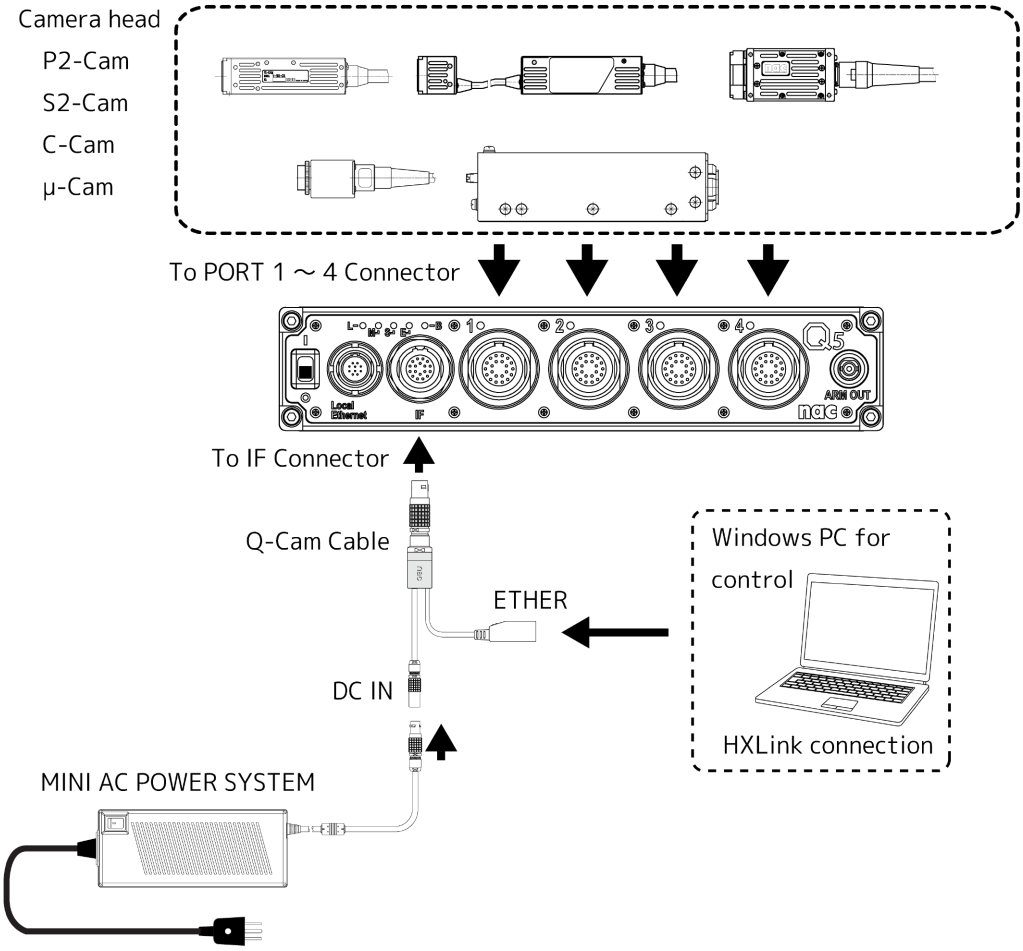
※2　Q-Cam cable (option) required.

※3　If used with Q-HUB, a Q-CAM remote cable (option) is required.

※4　P2-Cam, S2-Cam, C-Cam, μ-Cam (option) required.

※5　ARM OUT cable (option) required.

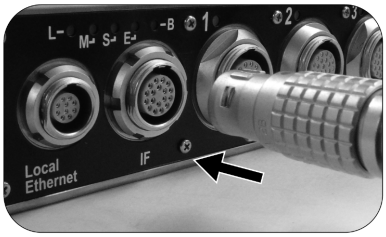
Connection Drawing



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

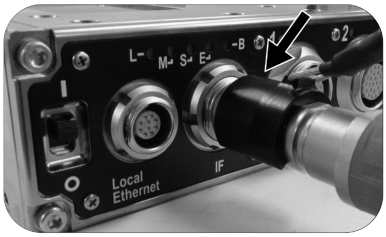
Connect the Q-Cam cable

Connect the Q-CAM cable sold separately.



1 Connect the Q-CAM cable to the Q5

- Line up the red arrow of the Q-CAM cable plug with the IF connector on the Q5 and plug in until it clicks.



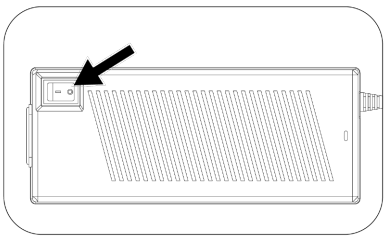
2 Install the locking clip

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

Attention
- Make sure to install the locking clip when using in environments where there is vibration or impact.
- The Q-CAM cable is a dedicated cable for Q5, Q1m/Q1v and Q-HUB. Do not use with the MEMRECAM GX or HX series.

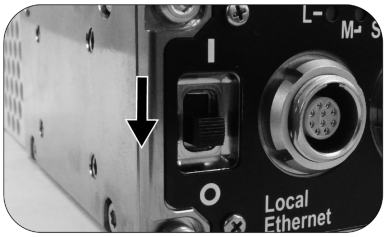
Connect the Power

Connect the MINI AC POWER SYSTEM sold separately.



1 Turn the power switch OFF

- Turn the AC adapter power switch OFF.

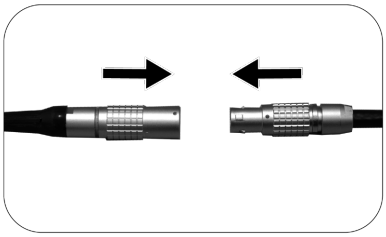


2 Turn the Q5 Power switch OFF

- Turn the Q5 Power switch OFF

3 Connect the AC cable to the AC adapter

4 Plug the AC cable in



5 Connect the DC cable to the Q-CAM cable

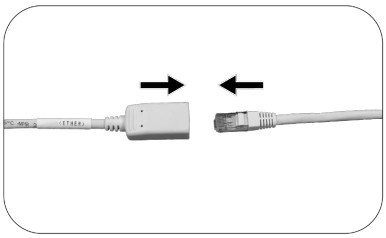
- Line up the red arrow of the AC adapter DC plug with the DC IN connector on the Q-CAM cable and plug in until it clicks.
- When unplugging the DC plug, hold the grip of the plug and pull straight out.

Attention

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

Connect a Windows PC Controller

Connect to a PC using an Ethernet cable.



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

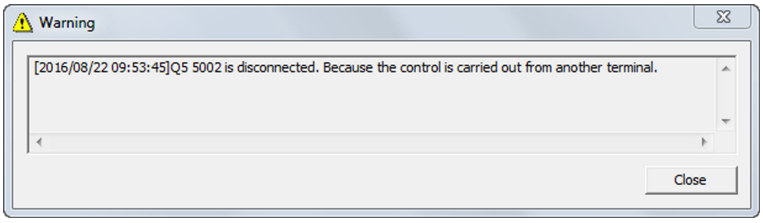
- Connect the Ethernet cable to the Ethernet (RJ45) connector of the Q-CAM cable. Connect another Ethernet cable to the Windows PC.

Attention
- The Q1m/Q1v is designed according to 1000BASE-T communication standards. If remote communication standards (100BASE-TX and such) are used, there will be a reduction in the updating rate.
- Use a category 5e (CAT5e) cable or greater for the Ethernet cable
- Q5 is not supported by DHCP. (⏩🕮 3-2)

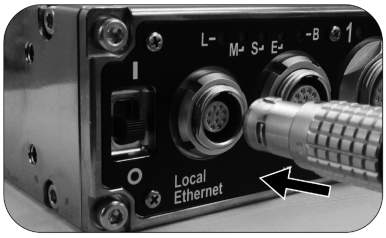
Connect the LOCAL ETHER cable

If connecting the Q5 to the Q-HUB, the Q5 is controlled from the Q-HUB. If you wish to directly control the Q5 locally from outside the network, connect a LOCAL ETHER cable to control the Q5.

Attention
- If you connect the Q5 to the Q-HUB and connect to another PC or network with a LOCAL ETHER cable when controlled by the HXLink, an error message will be displayed on the HXLink. Also, the Q5 will be disconnected from the HXLink.

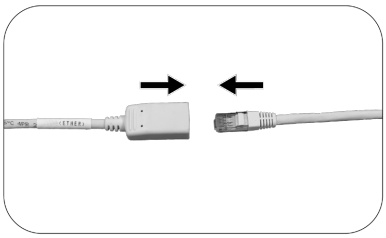


- If a LOCAL ETHERNET connector is connected, the IF connector ETHER will not be valid.



1 Connect the LOCAL ETHER cable to the Q5

- Line up the red arrow of the LOCAL ETHER cable plug with the LOCAL ETHERNET connector on the Q5 and plug in until it clicks.



2 Connect an Ethernet cable to the Ethernet connector of the LOCAL ETHER cable. Connect a Windows PC

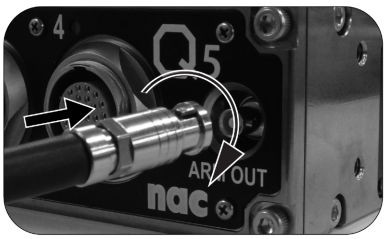
- Connect the Ethernet cable to the Ethernet (RJ45) connector of the LOCAL ETHER cable. Connect another Ethernet cable to the Windows PC.

Attention
- The Q5 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.
- Q5 is not supported by DHCP. (⏭🕮 3-2)

Connect the ARMOUT cable

Since the ARM status output signals are output by the ARM OUT connector, it is possible to verify the Q5 ARM status.

Attention • The ARM OUT connector is a separate dedicated connector from the ARM status output of the IF connector.



1 Connect the ARM OUT cable to the Q5

- Line up the ARM OUT cable plug with the ARM OUT connector on the Q5, plug it in and turn to the right. Make sure it is locked.

CHECK • ARM OUT output specifications. (⏭🕮4-40)

Connect the Camera

This describes the method of connecting the camera.

Cable lengths that can be connected

The cable lengths can be extended according to the application of the camera connected to the Q5. There are limitations to the cable lengths that can be used for each camera.

・Normal Use

・Camera extension unit　　Using the BB1 UNIT (option)

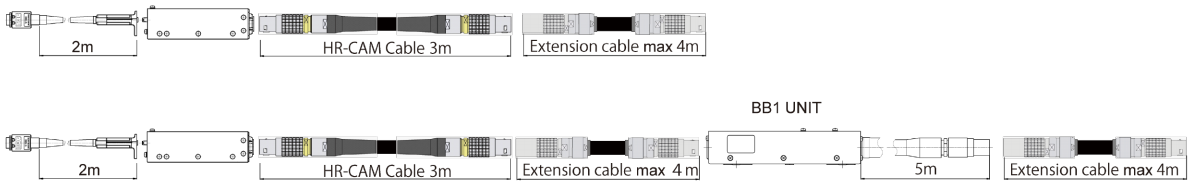
CHECK • The cable length is the length of the cable from the sensor to the connector that is connected to the Q5.

Attention • If connected the Q5 to the Q-HUB, the BB1 UNIT cannot be used.

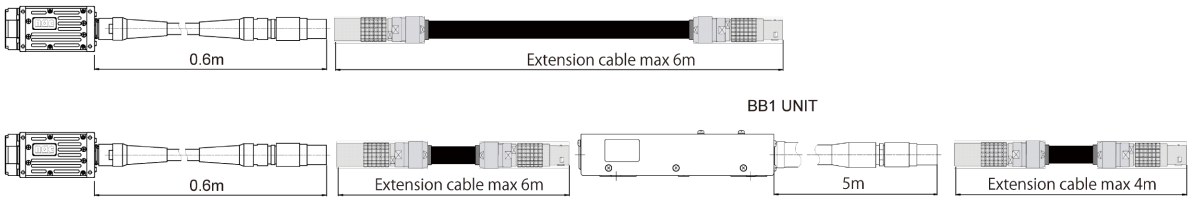
Camera	Maximum cable length	
	Normal use　(m)	Camera extension unit Using the BB1 UNIT (m)
μ-Cam	9	18
C-Cam	6.6	15.6
S2-Cam	7.5	16.5
P2-Cam	6.6	15.6

Cable length for each camera (Maximum length)

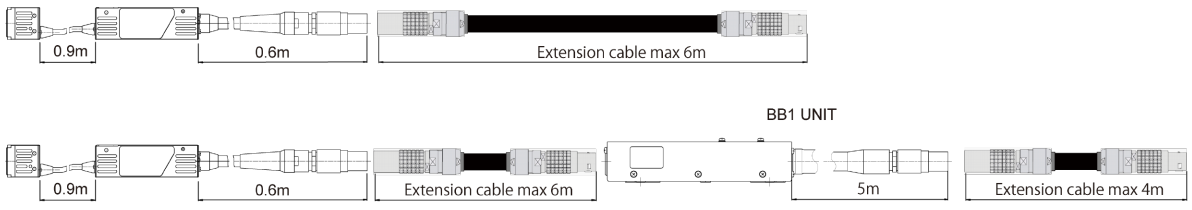
μ-Cam



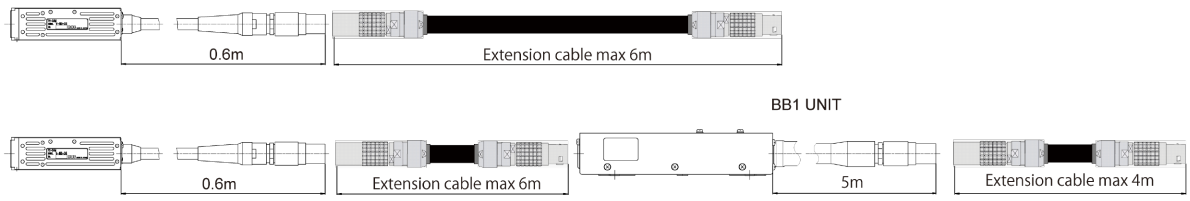
C-Cam



S2-Cam



P2-Cam



Status LED

The status LED show a state of MEMRECAM Q5.

Status LED

The five status LED on the front panel show the Q5 status.

L	(LOCAL ETHERNET)	Shows the LOCAL ETHER cable connection status
M	(MODE)	Shows the Q5 mode status
S	(STATUS)	Shows power ON/OFF, file status
E	(ETHER)	Shows the ethernet connection status
B	(BATT)	Shows the memory backup status and thermal shutdown

CHECK

- The thermal shutdown is a function that automatically turns the power OFF when the internal temperature of the Q5 rises to above a set temperature（The power switch of Q5 becomes invalid then）.
- When thermal shut down occurs, please return in the following procedures.
  1. Turn off the power switch of the AC adapter. When it connects Q5 to Q-HUB, please turn off a power supply of Q-HUB.
  2. Turn off power switch of Q5.
  3. Turn on the power switch of the AC adapter. When it connects Q5 to Q-HUB, turn on a power supply of Q-HUB.
  4. Turn on power switch of Q5.

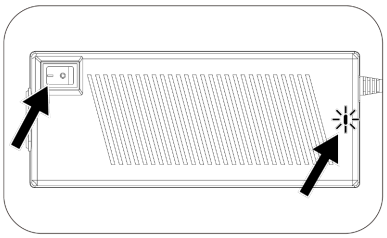
LED	LED Status	Operation	▸▸🕮
L (LOCAL ETHER)	Lit green	The local Ethernet cable is connected	6-14
	Not lit	The local Ethernet cable is not connected. Or the power is OFF	6-15
M (MODE)	Orange (REC)	REC mode (camera image output, camera image memory recording after trigger detection)	
	Blue (STOP)	STOP/READY mode (memory image output. Playback mode or transfer mode after startup)	
	White (VIEW)	VIEW mode (camera image output, saves recorded contents in the memory)	
	Magenta (ARM)	ARM mode (camera image output, destroys recorded contents in the memory, records new camera image in the memory)	
	Not lit	Power OFF. Or starting up	
	Flashing (EST)	Set to EST mode, and EST pulse is input. Only in VIEW, ARM, REC mode.	
S (STATUS)	Lit green	Normal status	
	Lit red	File status (Abnormal power voltage detected)	
	Flashing red	File status (Elevated Q5 DRP internal temperature detected) ・Flashing slowly Warning temperature ・Flashing quickly Danger temperature	
	Not lit	Power OFF. Or starting up	
E (ETHER)	Flashing green	Network communication with 100BASE-TX	
	Lit orange	Network communication with 1000BASE-T	
	Not lit	Not connected to the network via IF connector. During connection or a power supply is OFF with a local ether cable.	

LED	LED Status	Operation	⏩🕮
B (BATT)	Lit green	Backing up with external power (Battery charge H)	
	Flashing green	Backing up with battery (Battery charge H)	
	Lit orange	Backing up with external power (Battery charge M)	
	Flashing orange	Backing up with battery (Battery charge M)	
	Lit red	Backing up with external power (Battery charge L)	
	Flashing red	Backing up with battery (Battery charge L)	
	Not lit	Memory backup is OFF	
	Alternating red and green	Thermal shutdown started	

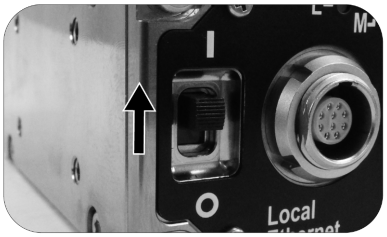
Turn the Power ON/OFF

Power on the MEMRECAM Q5.

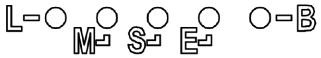
Start up the Q5



1 Turn ON the power switch of the AC adapter
- Turn the switch ON after verifying that the cable is connected to the AC adapter and camera.
- The LED of the AC adapter lights.



2 Turn the Q5 power switch ON



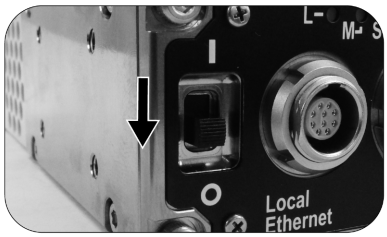
3 Confirm the status with the status LED
- The Q5 starts up and automatic diagnosis starts.
- M(MODE) : Lit blue
  S(STATUS) : Lit green
  Upon reaching this status, the Q5 starts up normally.

4 Execute the operations using the control software.

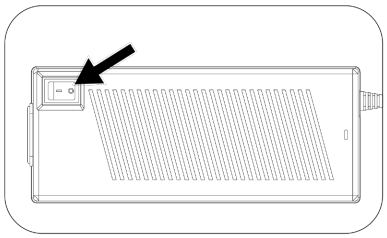
Turn Off the Q5 Power

1 Disconnect the HX Link and camera with the Windows PC

- Make sure to save the recorded image before disconnecting.
- Disconnect the HX Link and Q5.



2 Turn OFF the Q5 power switch



3 Turn OFF the AC adapter power switch

Attention

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

3

Basic Operations

(00419)D

Setting the IP Address

The Q5 does not automatically get the IP addressed using the DHCP server.
Please set the IP address according to the network environment used.

Attention

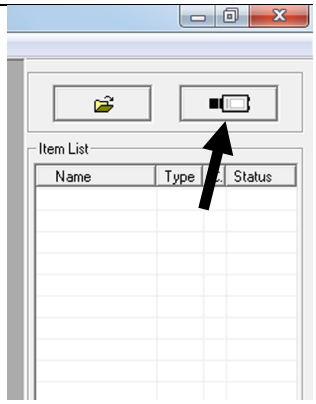
- This manual is for the Q5. The Q1m/Q1v cameras can be changed with the same methods. Refer to each camera user's guide for the GX and HX series and to the user's guide for the HXLink.
- HXLink, GenICam, and GigE Vision Filter Driver must be properly installed.
  There are times when proper operation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

Check the IP Address Setting

The IP address can be checked with HXLink if the Q5 is connected to the network used.

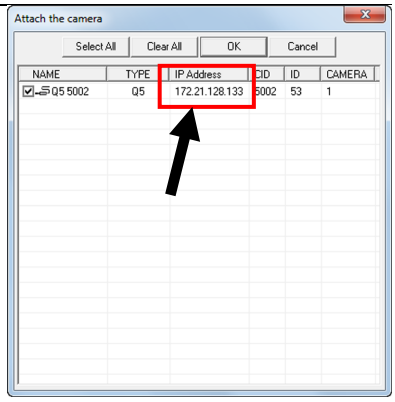
1 With the power to the Q5 ON, press the HXLink camera connection.

- Press the camera connection button to add an item.



2 Confirm the IP address from the list.

- The connected Q5 is shown on the list so the IP address can be confirmed.



Attention

- Connection to the HXLink is not possible if the Q5 network is not properly set, and an error will be displayed.

Set the Q5 IP Address

Attention

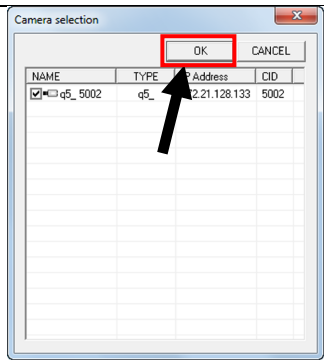
- The HXUtility is “Camera System Setup” (“Camera System Setup 64” with the 64bit version OS).

1 Press “Video and IPAddress settings” in HXUtility

- Press the “Video and IPAddress settings” button in the menu.

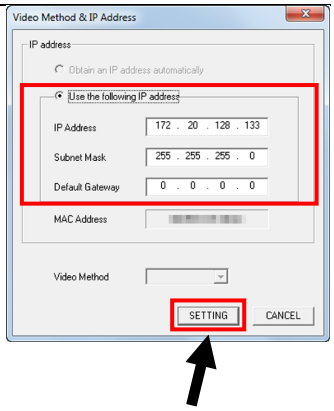
2 Select Q5 to change from the list.

- The Q5 that can have the settings changed is shown on the list so select the camera and press “OK”.



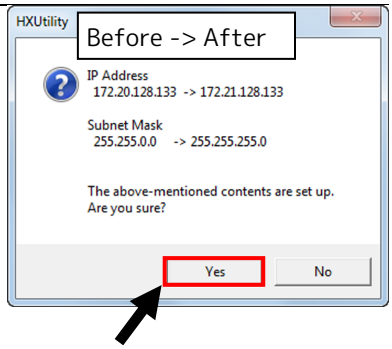
3 Input the IP address to set

- Set the IP address, sub-net mask and such to match the environment used.
- Press “SETTING” once the input is complete.



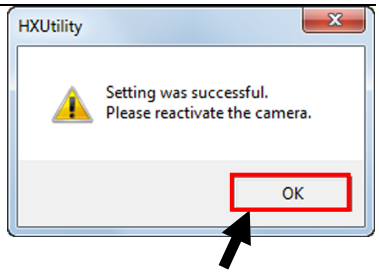
4 The detailed contents to change are displayed.

- The left side of the display is “before the change” and the right side shows “after the change”.
- If there are no errors in the setting contents, press “Yes”. Press “No” to correct by returning to the settings screen.



5 After setting, turn ON the camera power

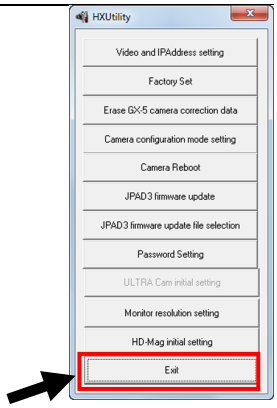
- After the message is shown, turn on the Q5 power.
- Press “OK” to close the window.



6 The HXUtility ends

- Press “Exit” to close the HXUtility.

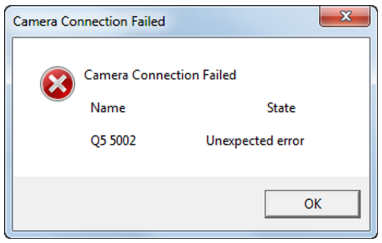
Attention Make sure to close the HXUtility before using HXLink.



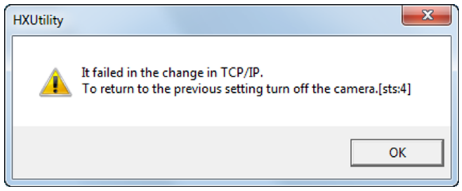
7 The revised IP address will be enabled after the camera has been restarted.

CHECK

- When the Q5 is connected to HXLink after setting the IP address, the following error message may appear. In this case, the IP address setting may be incorrect so please check and reset if necessary.



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



Attention

- It is necessary to change the IP address of the control PC to the connectable setting in the IP address after the Q5 change beforehand. The modifiable IP address of Q5 depends on the setting of the IP address of the PC.

Using HXLink

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

CHECK

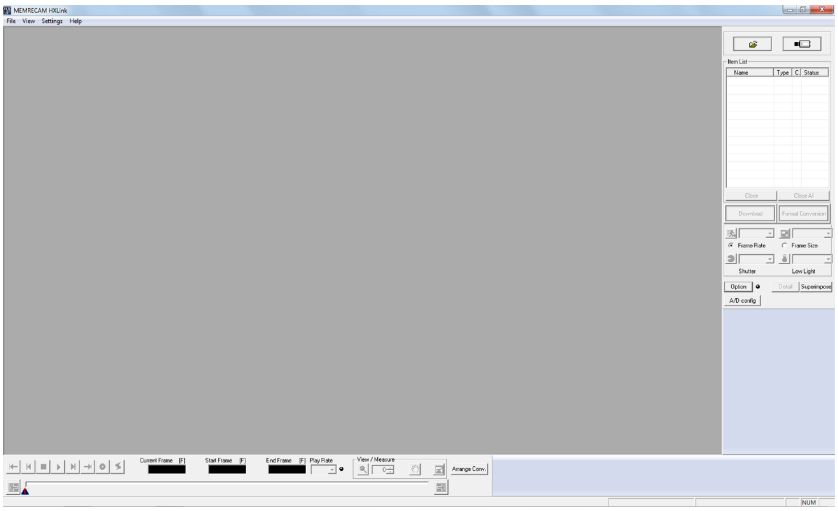
- Refer to the HXLink user's guide for the method of installing the application or details on the method of use.

HXLink GUI

The HXLink GUI includes a "Basic Mode" and an "Expert Mode".

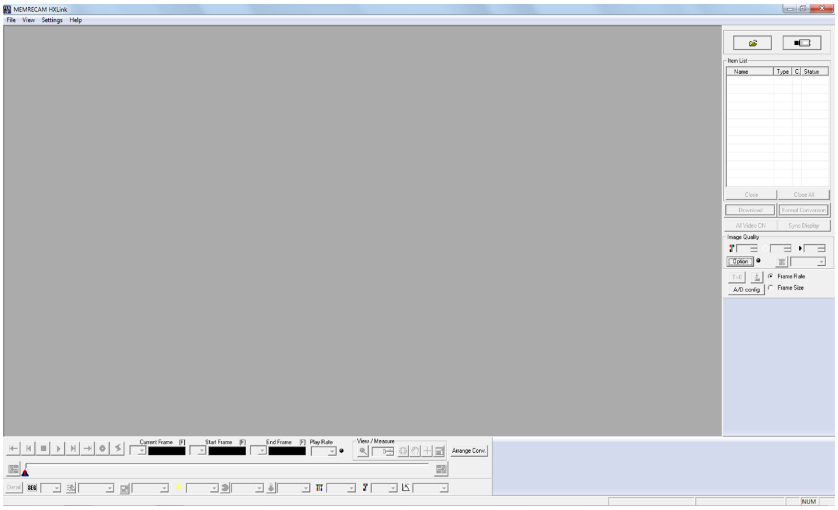
Basic Mode

Performs basic operations



Expert Mode

Performs detailed operations.

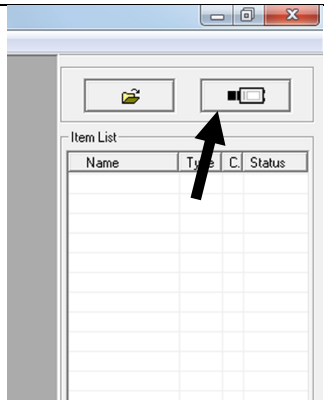


Descriptions in this guide use the "Basic Mode".

Connect the Camera

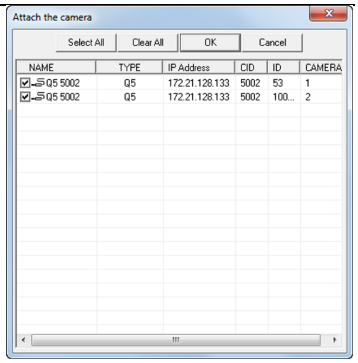
1 Press connect camera

- Press the connect camera button to add an item.

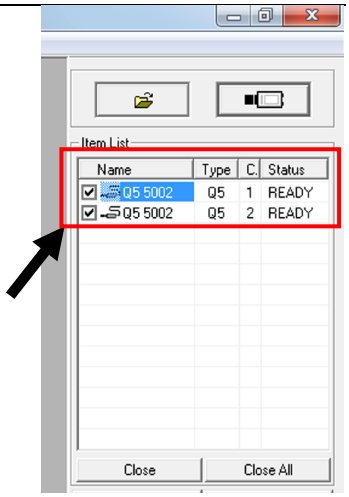


2 Select Q5 from the list.

- Once the cameras that can be connected are displayed on the list, select the cameras to be used and press “OK”.
- The illustration shows two camera heads connected to the Q5.



3 The connected camera is added to the item list.



Configuring the Camera Head

A maximum of 4 camera heads can be connected to a single Q5. When connecting, make the settings according to the number and type of camera heads.

Attention
- Make sure to turn the Q5 power OFF (It is OFF with power switch of power supply of the AC adapter or Q5) when replacing the camera head. If the cable is plugged in or removed when the power is ON, this may cause a malfunction between the Q5 and the camera head.
- Recorded image data is lost if the configuration is changed so make sure to save any necessary data to a PC.
- Please change exchange / of a camera head after downloading data when there are the data which it recorded on Q5.

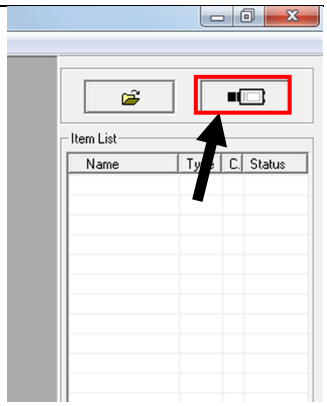
CHECK
- With HXLink, P2-Cam/S2-Cam/C-Cam/μ-Cam are all treated as the same type of camera head “P-CAM”.

Settings

1 Turn the power ON after connecting the camera head to the Q5

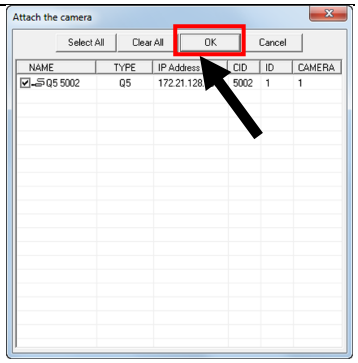
2 Press connect camera on the HXLink.

- Press the connect camera button to add an item.



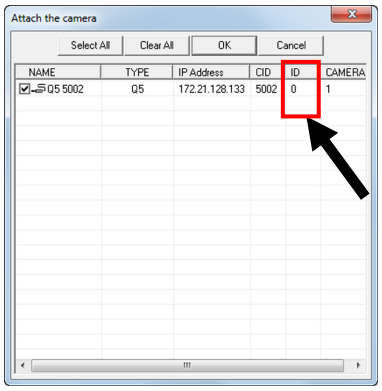
3 Select Q5 from the list.

- Once the Q5 that can be connected is displayed on the list, select the camera to be used and press “OK”.

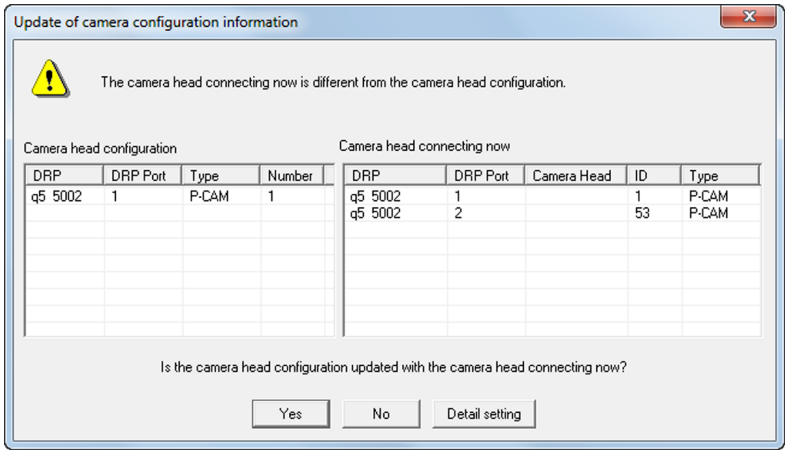


CHECK

- When 0 is displayed by an ID column, this indicates that a camera head is not connected to a port (CAMERA column) set in Q5 (or nothing is effective).



4 A window is shown where it is possible to confirm the contents previously set to the Q5 and the currently connected camera heads.



The display items are as follows.

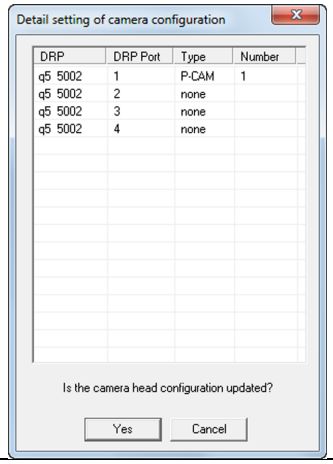
<Camera Head Configuration>

DRP	DRP nickname
DRP Port	# of the DRP port where the camera head is connected
Type	Camera head type (shown as P-CAM)
Number	Camera head number (lowest number of the "DRP ports")

<Camera head connecting now>

DRP	DRP nickname
DRP Port	# of the DRP port where the camera head is connected
Camera Head	Camera head nickname The nickname registered for the registered camera head is shown.
ID	Camera head ID Needed for camera registration of the camera head.
Type	Camera head type (shown as P-CAM)

CHECK • Press Detailed settings for the camera configuration to display the details of the current configuration.



5 Press “Yes” to change the settings and “Cancel” for no changes.

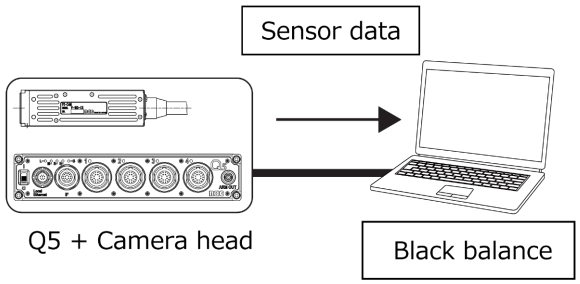
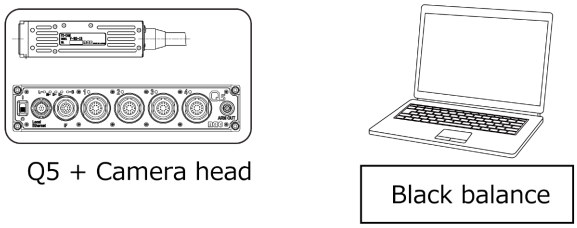
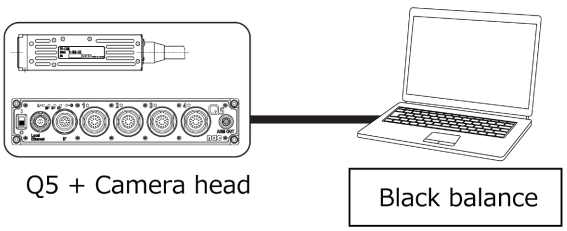
Attention • Recorded images are lost if the configuration is changed. If the image hasn’t been saved yet, press “No (Cancel)”, save to the PC and then do this again.

6 If “Yes” is pressed, the communication between the Q5 and the PC will be temporarily disconnected but it will be automatically reconnected with the camera head that is currently connected.

Black Balance

To correct the fixed pattern noise of the sensor, get the black balance (noise and black level correction data).

The noise on the image sensor used by the camera head changes according to the temperature of the sensor and the recording settings. This noise is called fixed pattern noise and has a pattern that varies by the individual sensor. The Q5 reads the temperature of the image sensor and automatically performs noise reduction with the registered image correction data but black balance just before filming is recommended to get the best quality image.

Get the black balance	 Reads the sensor data from the camera head and produces black balance (corrected data) on the control PC.
If the camera is disconnected	 Even if disconnected from the Q5, the black balance obtained is saved in the control PC.
If reconnecting	 The saved black balance can be used.

Attention
- The black balance is saved to the connected PC. Make sure to get the black balance if the camera is connected to another PC.
- There are a 32bit version and a 64bit version in HXLink and manages the data of the black balance separately. When it becomes the use in both, please take black balance separately.
- Make sure to cover the lens cap during black balance.

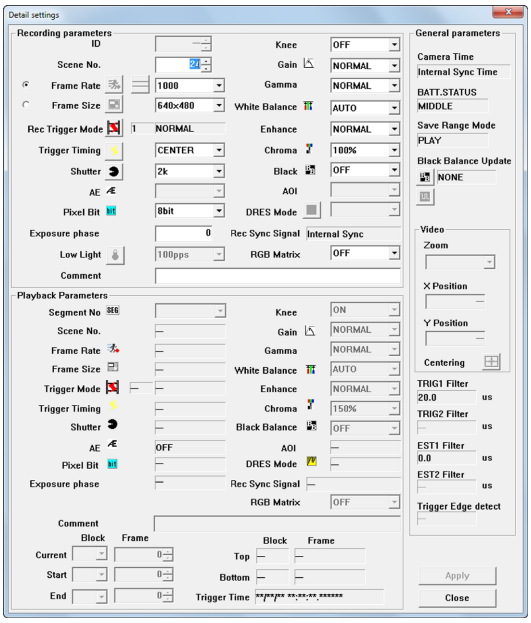
Get the Black Balance

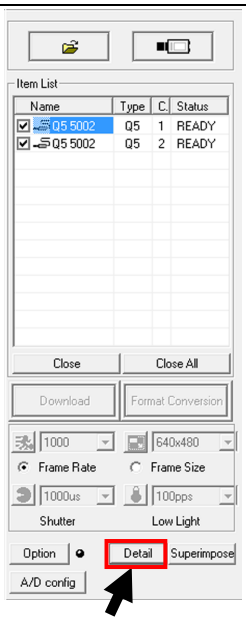
1 Set the “frame rate” and “frame size” for filming.
- Set the recording settings for the camera.
- Switch the camera to the stop state (STOP mode).

2 Mount the lens cap to the lens to cover
- Prevent light from reaching the lens

Detail

3 Press “Detail” to show the “Detail settings” window.
- The “Detail Settings” window will appear.





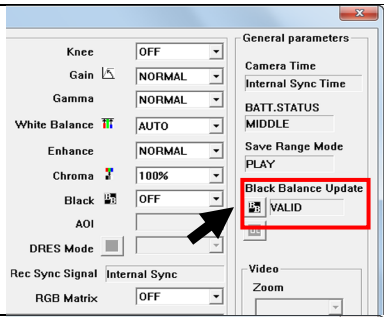
4 Press the update black balance button

- The following statuses are recommended.

  NONE : The black balance isn't ready.

  BUSY : Getting the black balance.

  VALID : Finished getting the black balance.

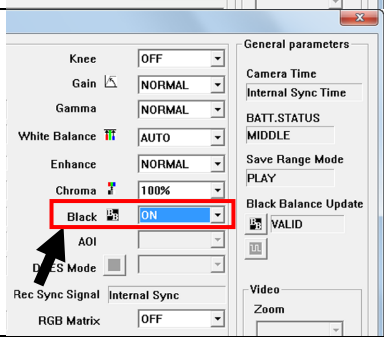


5 Enable/disable the black balance

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

  ON : Use black balance corrected data.

  OFF : Do not use black balance corrected data.



6 Remove the lens cap for recording

- Record using the black balance corrected data.

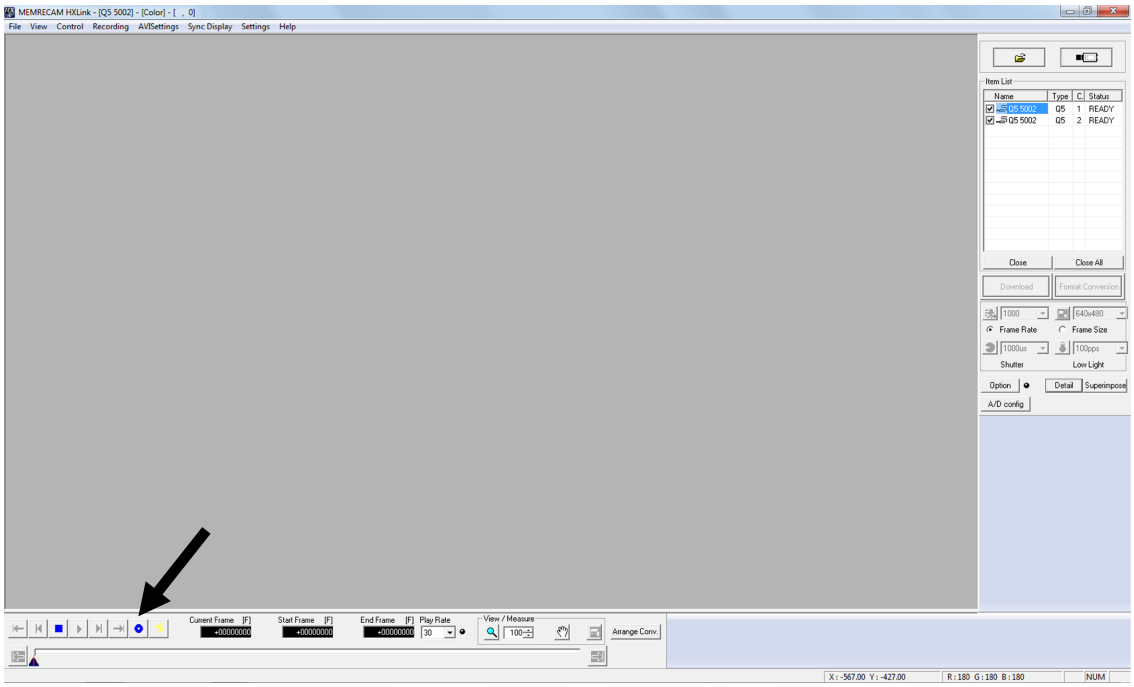
Attention

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

Stop (STOP Mode)

The MEMRECAM Q5 switches to the STOP mode after starting up.

Switch to the STOP mode



Press the stop button during each mode

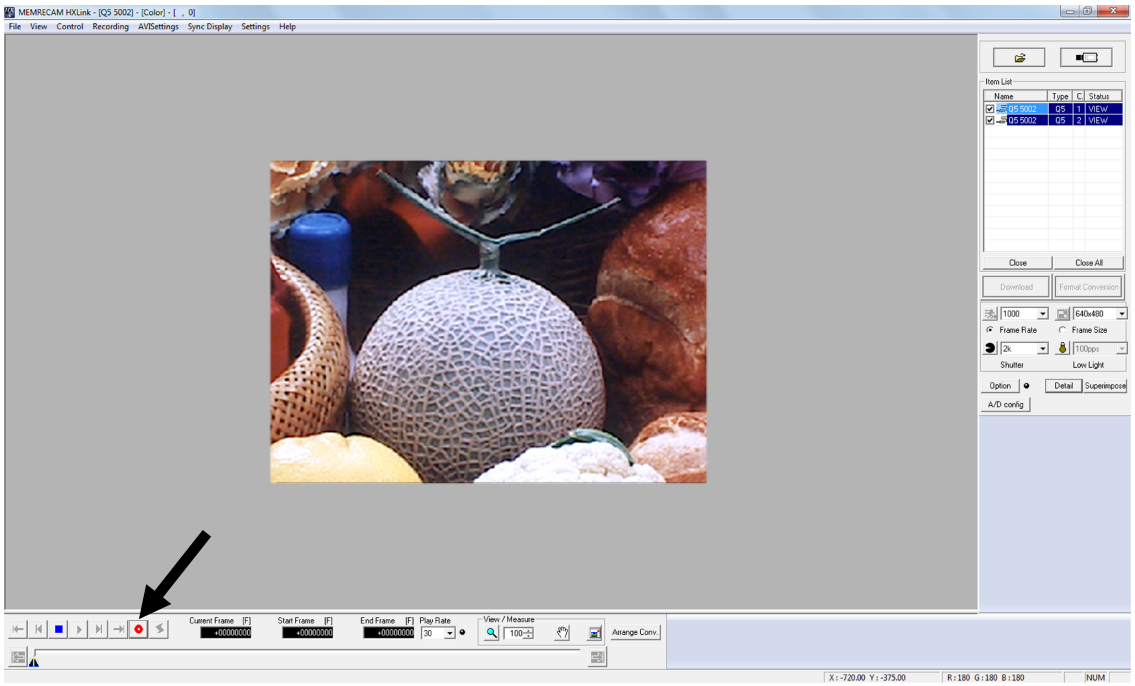
- The STOP mode can be access from other camera modes, including the VIEW mode and the ARM mode.
- The item list STATUS will show “READY”.
- MODE in the status LED will light up in blue.

CHECK • Storage settings can be set in the STOP mode.

Display Live Images (VIEW Mode)

Display live images with the VIEW mode and make the recording settings or adjust the camera and lens.

Switch to the VIEW Mode



Press the view/record button during each mode

- Switch to the VIEW mode from the STOP mode.
- Adjust the zoom or focus of the lens, the subject or the recording settings while looking at the live image in the VIEW mode.
- The item list STATUS will show “VIEW”.
- M (MODE) in the status LED will be lit in white.

Attention • Live images cannot be displayed when the STATUS is flashing red, even when in the VIEW mode. (⏭🕮 2-12)

Basic Recording Settings

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

Select the Frame Rate

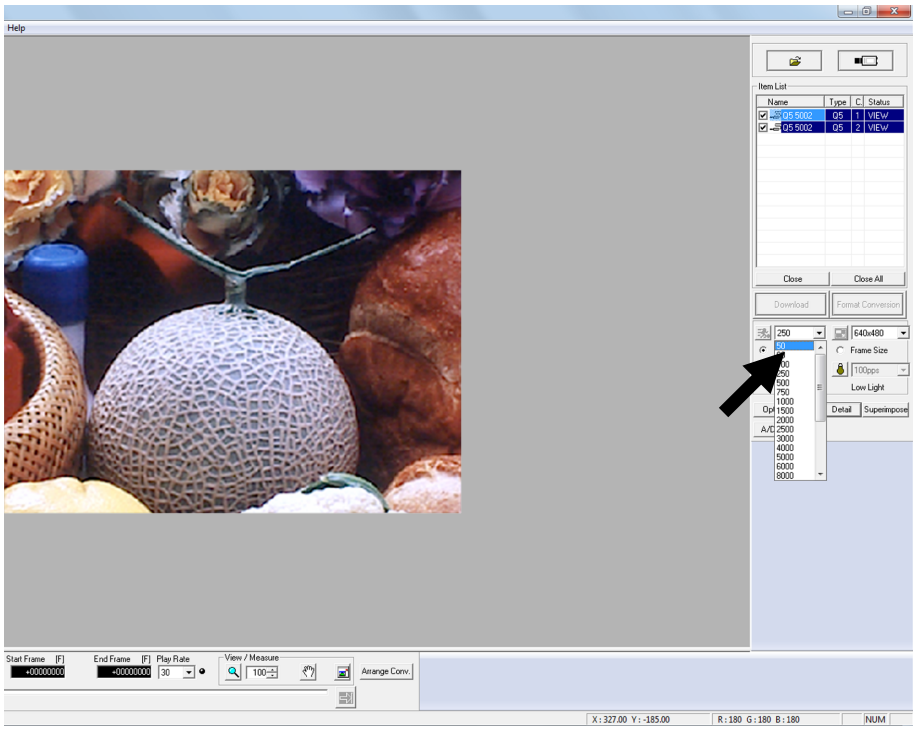
Set the frame rate (frames per second) according to the image and subject filmed.

1 Access the VIEW mode

- Switch to the VIEW mode. (⏭🕮 3-16)

2 Select the frame rate

- The frame size is limited by the frame rate. The frame size changes as the frame rate increases.
- Refer to (⏭🕮 3-19) for the frame rates and frame sizes that can be selected.



Attention • Get the black balance again after changing the frame rate. (⏭🕮 3-12)

Select the Frame Size

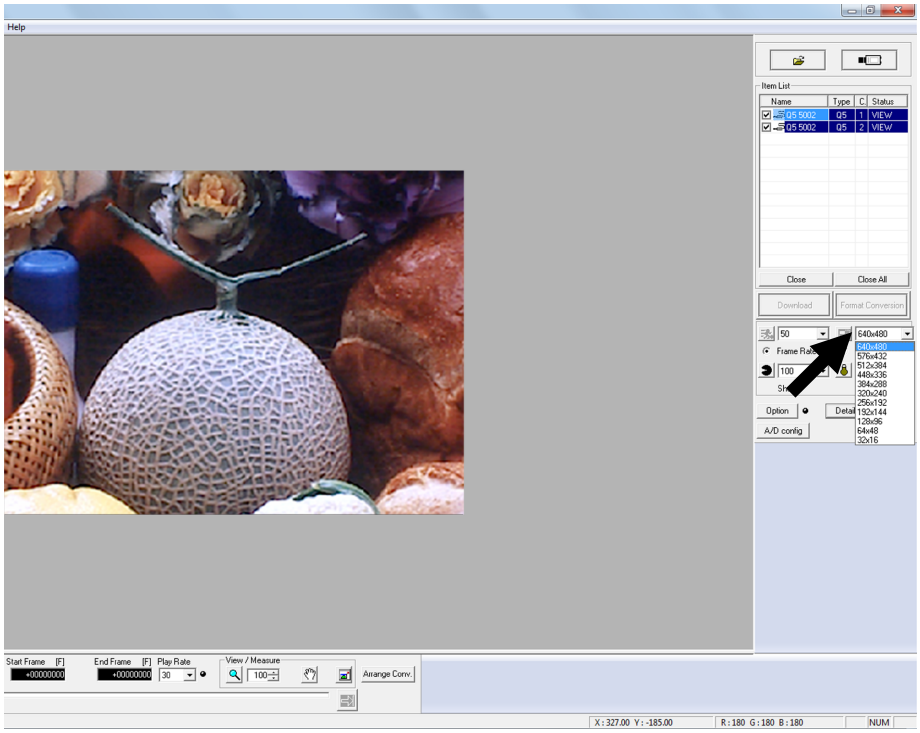
Set the frame size according to the image and subject filmed.

1 Access the VIEW mode

- Switch to the VIEW mode (▶▶🕮 3-16)

2 Select the frame size

- The frame rate is limited by the frame size. The frame rate changes as the frame size increases.
- Refer to (▶▶🕮 3-19) for the frame sizes and frame rates that can be selected.



Attention • Redo the black balance again after changing the frame rate. (▶▶🕮 3-12)

Frame Rate and Frame Size P2-Cam/S2-Cam

Frame Rate (pps)	Frame Size										
	32 × 16	64 × 48	128 × 96	192 × 144	256 × 192	320 × 240	384 × 288	448 × 336	512 × 384	576 × 432	640 × 480
50	○	○	○	○	○	○	○	○	○	○	○
60	○	○	○	○	○	○	○	○	○	○	○
100	○	○	○	○	○	○	○	○	○	○	○
250	○	○	○	○	○	○	○	○	○	○	○
500	○	○	○	○	○	○	○	○	○	○	○
750	○	○	○	○	○	○	○	○	○	○	○
1,000	○	○	○	○	○	○	○	○	○	○	○
1,500	○	○	○	○	○	○	○	○	○		
2,000	○	○	○	○	○	○	○	○			
2,500	○	○	○	○	○	○	○				
3,000	○	○	○	○	○	○					
4,000	○	○	○	○	○	○					
5,000	○	○	○	○	○						
6,000	○	○	○	○	○						
8,000	○	○	○	○							
10,000	○	○	○	○							
15,000	○	○	○								
20,000	○	○									
25,000	○	○									
30,000	○	○									
40,000	○	○									
50,000	○	○									
60,000	○										
80,000	○										
100,000	○										

Attention
- If combining C-Cam with μ-Cam, it is only operational within the range of the C-Cam, μ-Cam presets.
- If combining μ-Cam, only 640*480 of μ-Cam can work.

Frame Rate and Frame Size C-Cam

Frame Rate (pps)	Frame Size										
	32 × 16	64 × 48	128 × 96	192 × 144	256 × 192	320 × 240	384 × 288	448 × 336	512 × 384	576 × 432	640 × 480
50	O	O	O	O	O	O	O	O	O	O	O
60	O	O	O	O	O	O	O	O	O	O	O
100	O	O	O	O	O	O	O	O	O	O	O
250	O	O	O	O	O	O	O	O	O	O	O
500	O	O	O	O	O	O	O	O	O	O	O
750	O	O	O	O	O	O	O	O	O	O	O
1,000	O	O	O	O	O	O	O	O	O	O	O
1,500	O	O	O	O	O	O	O	O	O		
2,000	O	O	O	O	O	O	O	O			
2,500	O	O	O	O	O	O	O				
3,000	O	O	O	O	O	O					
4,000	O	O	O	O	O	O					
5,000	O	O	O	O	O						
6,000	O	O	O	O							
8,000	O	O	O	O							
10,000	O	O	O								
15,000	O	O									
20,000	O										
25,000	O										

Attention • If combining μ-Cam, only 640*480 of μ-Cam can work

Frame Rate and Frame Size μ-Cam

Frame Rate (pps)	Frame Size			
	640 × 210	640 × 416	640 × 456	640 × 480
100	×	×	×	○
250	×	×	×	○
500	×	×	○	×
1,000	○	×	×	×
1,000 (Advance Sampling Mode)	×	○	×	×

Select the Shutter Speed

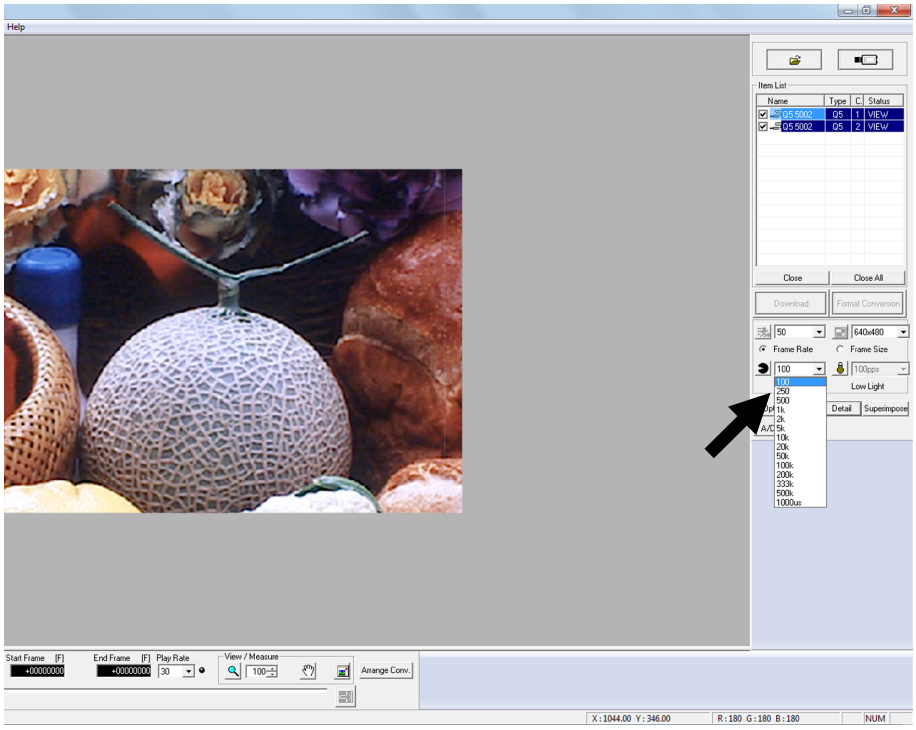
Set the shutter speed according to the image and subject filmed.

1 Access the VIEW mode

- Switch to the VIEW mode (▸▸🕮 3-16)

2 Select the shutter speed

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



Attention • If using black balance, redo the black balance again after changing the Shutter Speed. (▸▸🕮 3-12)

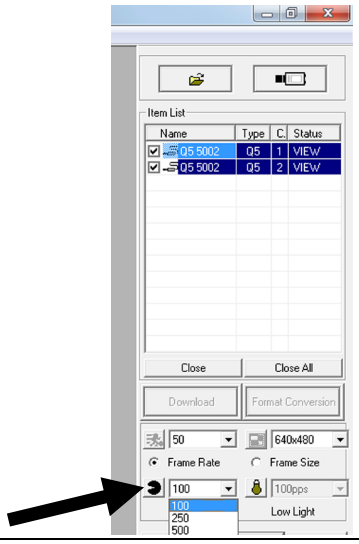
Shutter Speeds that can be Selected

Preset Shutter Speeds P2-Cam／S2-Cam	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
Preset Shutter Speeds C-Cam	OPEN、1/100、1/250、1/500、1/1,000、1/2,000、1/5,000、1/10,000、1/20,000、1/50,000
Preset Shutter Speeds μ-Cam	OPEN、1/100、1/250、1/500、1/1,000、1/2,000、1/5,000、1/10,000、1/20,000

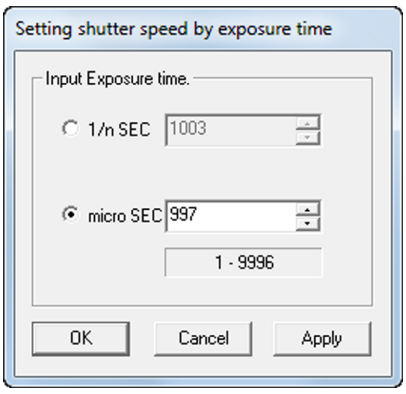
Attention • For speeds other than the preset shutter speeds, set using the custom shutter.

Set a Custom Shutter Speed

1 Press the custom shutter button



2 Input the custom shutter time



Attention
- There are limits to the shutter speeds depending on the frame rates.
- If a value greater than the shutter speed upper limit is input, the maximum value that can be set is set.

Using the Low Light Function

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

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

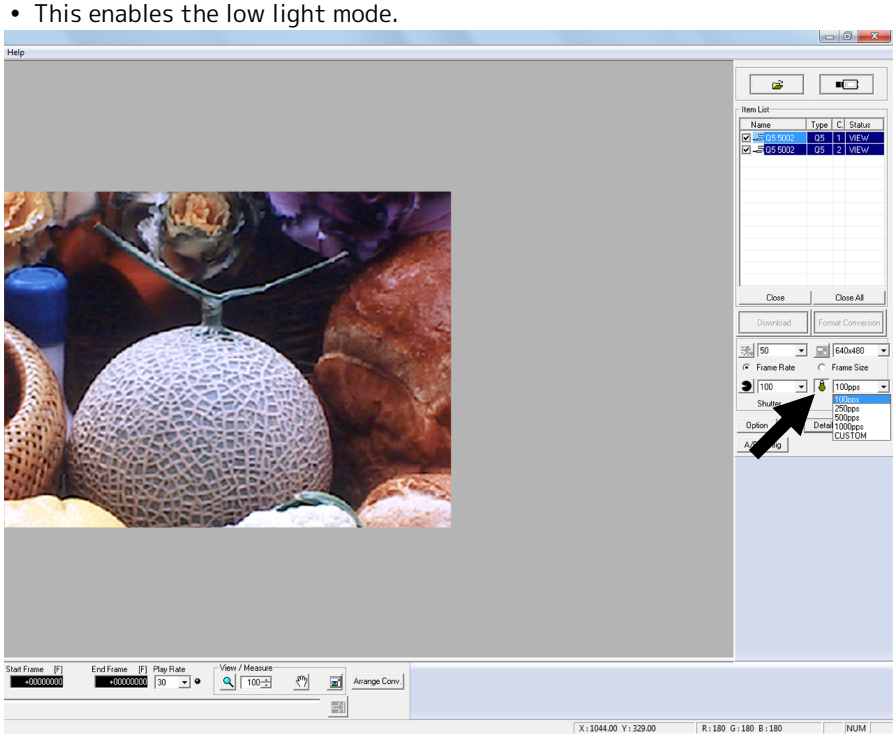
Enable the Low Light Function

1 Access the VIEW mode

- Switch to the VIEW mode (⏭🕮 3-16)

2 Click the low light button.

- This enables the low light mode.



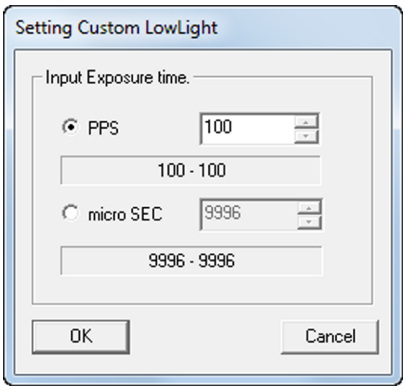
3 Select the brightness (exposure time) when the low light function is enabled.

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

Custom Set the Low Light Exposure Time

1 Select CUSTOM from the pull down menu

2 Input the custom exposure time

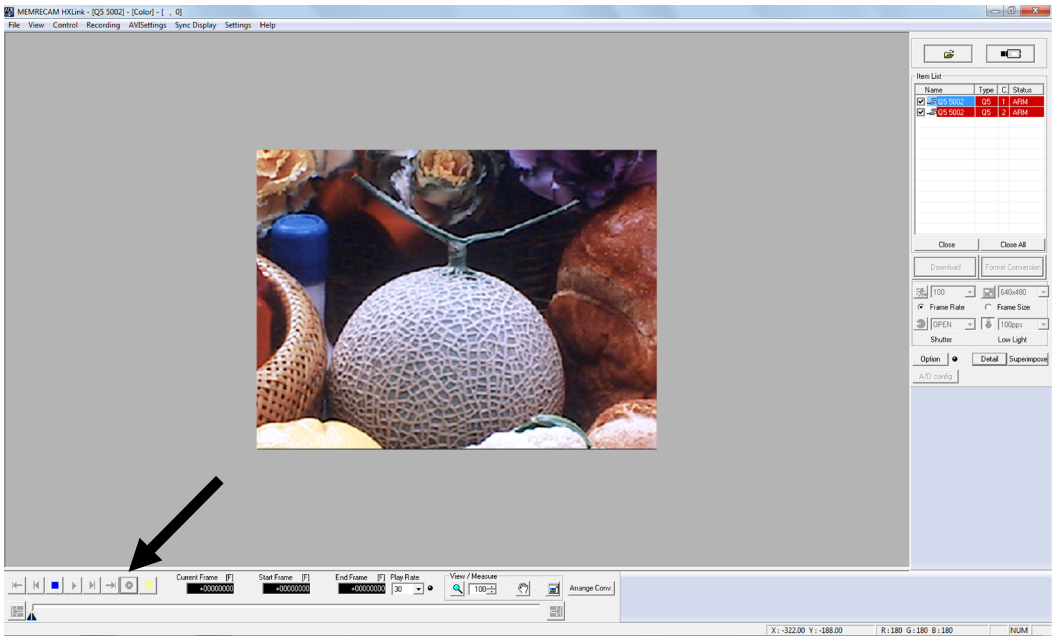


Start Recording (ARM Mode)

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

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

Switch to the ARM Mode



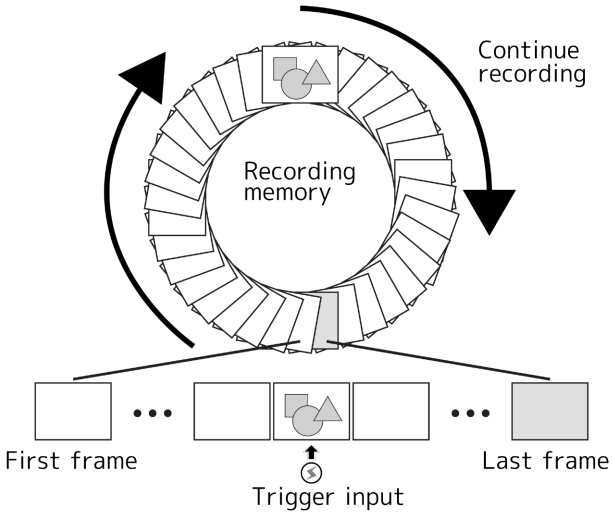
Press the view/record button in the VIEW mode

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

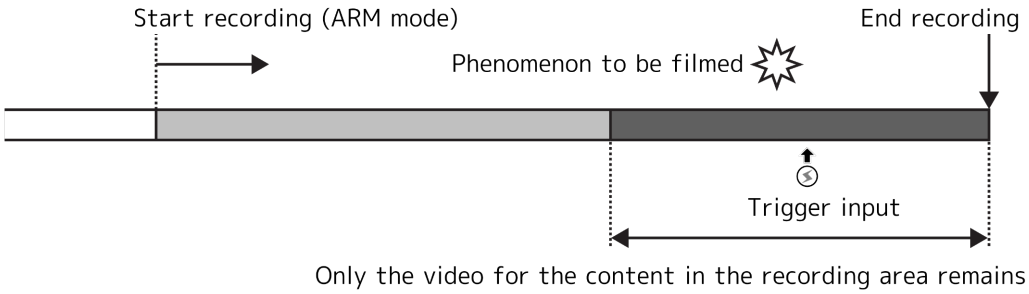
Attention
- Recording is not possible when the S (STATUS) is flashing red, even when in the ARM mode. (▸▸🕮 2-12)

Ring Buffer

In the ARM mode, the Q5 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.



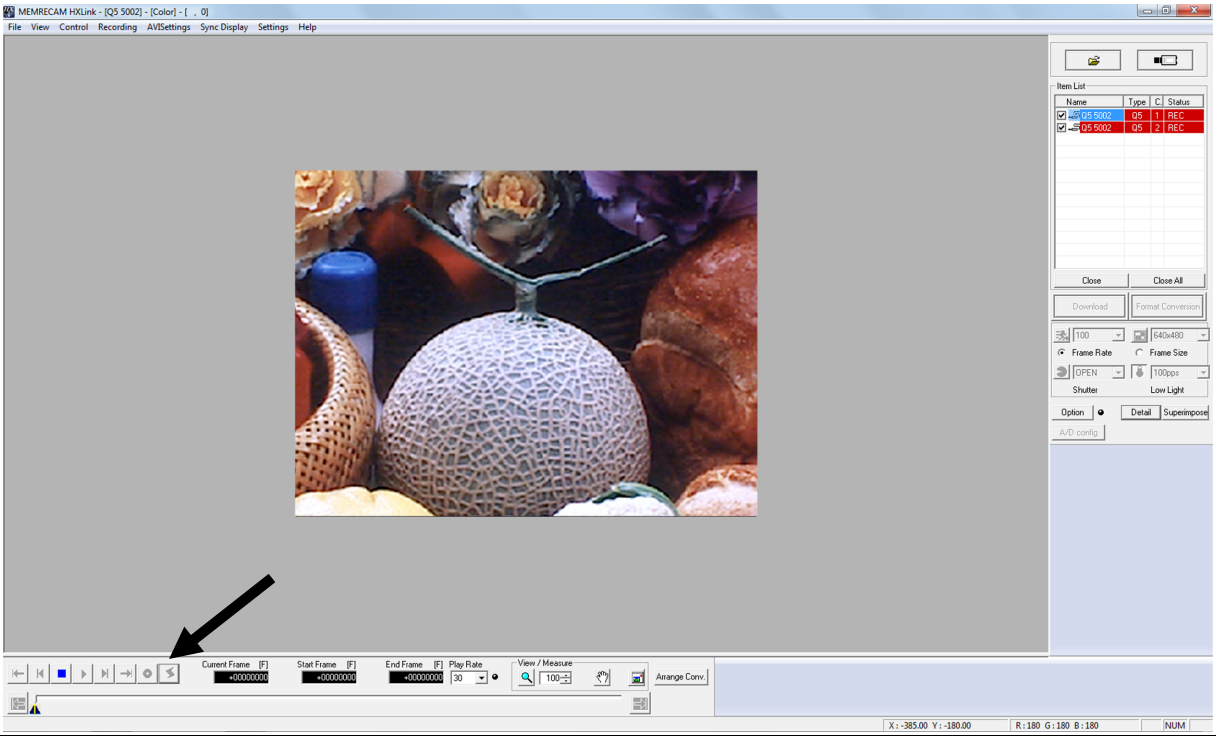
This operation continues until the trigger is input, when the overwrite recording is stopped according to the trigger input and trigger timing settings.



Trigger Input (REC Mode)

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

Trigger Input



Press the TRIG button while in the ARM mode

- Switch to the REC mode.
- The STATUS on the item list will show REC.
- The status LED for M (MODE) lights up in orange.

CHECK

- You can also input with the trigger instead of the HXLink.
  Input TRIG with external trigger input signals.
  Input with the G sensor trigger.

Memory Backup

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

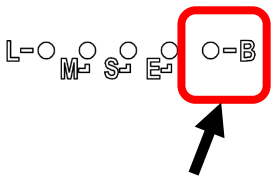
Attention
- If the AC adapter power is turned OFF when there is not enough charge in the battery, the recorded images will be lost.
- The memory backup is an additional function to prevent loss of images due to unexpected power outages. We strongly recommend turning the power off after saving any necessary images (▸▸🕮 3-35).

Enable Memory Backup

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

Memory Backup Status LED

If memory backup is enabled, the B (BATT) status LED lights up or flashes.



Green : Memory backup enabled (AC power + battery)

- The memory backup is enabled (video saved in the memory) and if the battery is connected, B (BATT) is lit.
- If the video is saved in the memory while the Q5 is operating, BATT is lit.
- Battery charge : High

Flashing Green : Memory backup enabled (battery only)

- If the power to the Q5 and the AC adapter is cut off and the memory backup functions with the battery, B (BATT) flashes green.
- Battery charge : High

Orange : Memory backup enabled (AC power + battery)

- Battery charge : Medium

Flashing Orange : Memory backup enabled (battery only)

- Battery charge : Medium

Red : Memory backup enabled (AC power＋battery)

- Battery charge : Low
- The memory backup time is shortened due to the low battery charge. Use the memory backup function after charging.

Flashing Red : Memory backup enabled (battery only)

- Battery charge : Low
- Plug in the AC adapter and charge the battery as soon as possible. Charging will start once power is supplied from the AC adapter. If not charged, the overdischarge protective function will start and the images in the memory will be lost.

OFF : Memory backup disabled

- If the memory backup is disabled (video not recorded in the memory), BATT is not lit.

Lit in alternating red and green : Thermal shutdown started

- If the temperature of the Q5 is abnormal, the power will shut OFF automatically, and the B (BATT) is lit in alternating red and green.

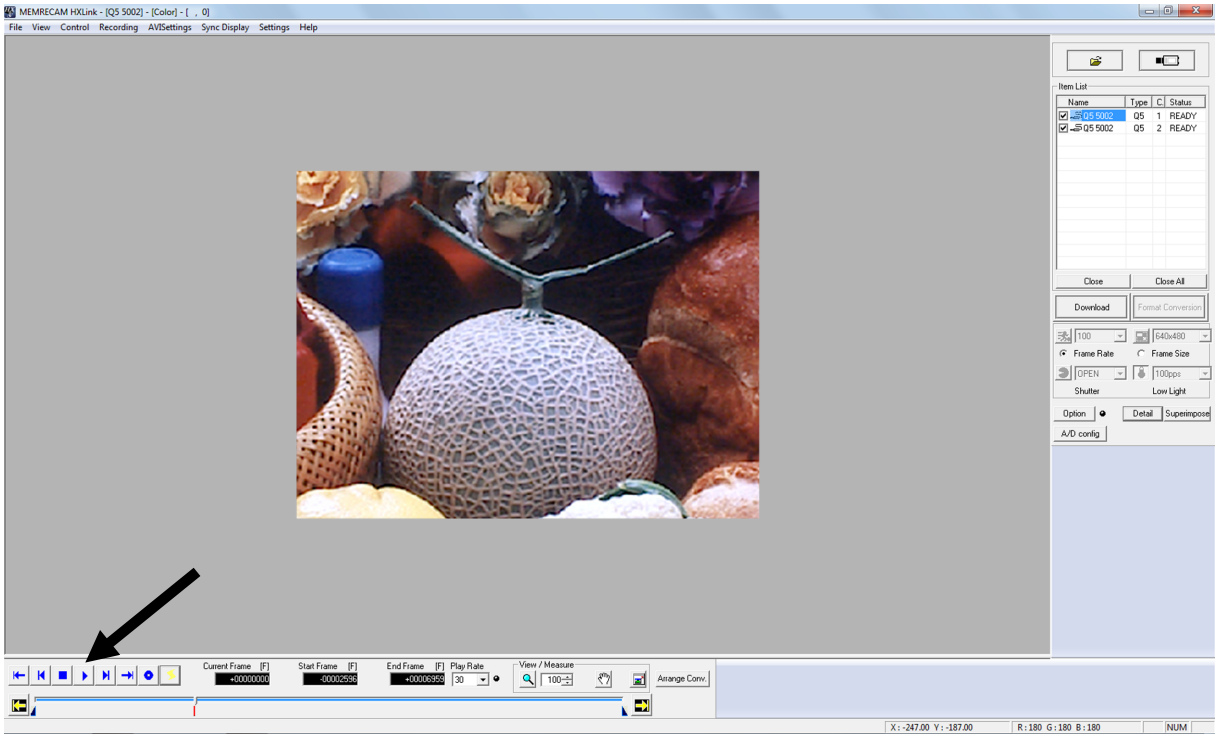
Attention

- Since the charge is affected by the individual differences in batteries and ambient temperature, the display is not exact. Use as an approximation.
- If the LED switches from flashing orange to red during memory backup with the battery, charge as soon as possible.
- When thermal shut down occurs, let you turn on the power switch of Q5 again after turning off the power supply of the AC adapter in becoming invalid and return. If the power is ON and there is a malfunction because the Q5 fan does not operate, the device can be damaged so contact the store or our company. Do not use, as it may be dangerous.

Playback (PLAY Mode)

Plays back the recorded image.

Playback



Press PLAY while in the STOP mode

- Switch to the PLAY mode from the STOP mode to play the recorded images.
- The item list STATUS will be PLAY.
- The M (MODE) status LED will be lit in blue.

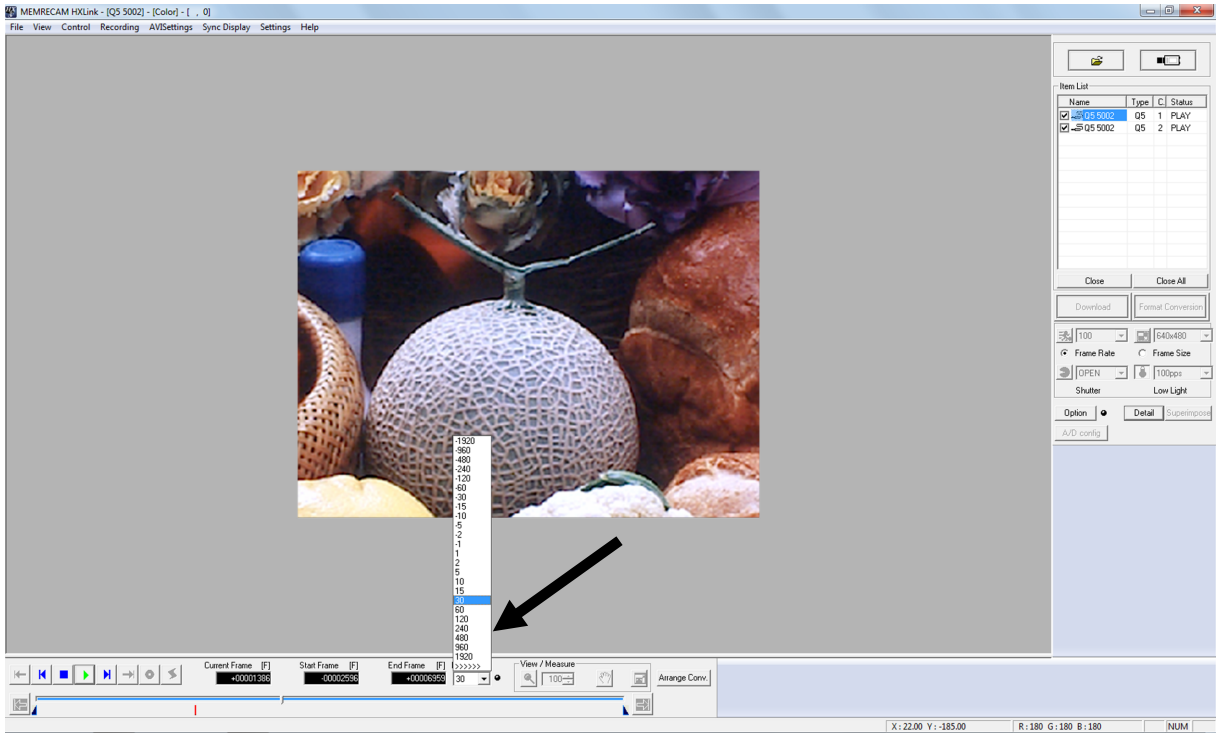
Operating Buttons

	**Jump to the Start Frame** Displays the playback start frame.
	**Rewind 1 Frame** Rewinds 1 frame when in the STOP mode. Press longer to rewind faster.
	**Stop** Stops the PLAY, VIEW and ARM modes and enters the STOP mode.
	**Play / Loop** Switches to the PLAY mode from the STOP mode. Keep pressing for loop playback. Press again in PLAY mode for loop playback.
	**Forward 1 Frame** Jumps forward 1 frame when in the STOP mode. Keep pressing for fast forward.
	**Jump to the End Frame** Displays the playback end frame.
	**View / Record** Switches to the VIEW mode from the STOP mode. Switches to the ARM mode from the VIEW mode.
	**Trigger** Accesses the trigger in the ARM mode. The trigger frame is displayed in the STOP mode.
	**Designate the Start Frame** Sets the current frame as the playback start frame.
	**Designate the End Frame** Sets the current frame as the playback end frame.

Change the Playback Speed

Changes the playback speed. Reverse playback can also be set.

Change the Playback Speed



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

・The spayback speed will be displayed and can be set.

Table of Playback speeds that Can Be Set

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

Saving Images

Download recorded images.

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

Save

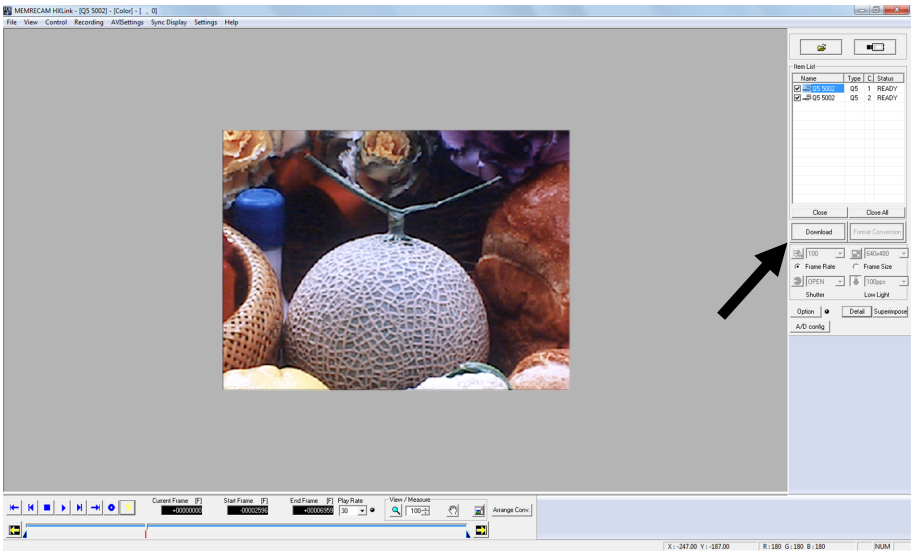
1 Access the STOP mode

• Switch to the STOP mode. (▶▶🕮3-15)

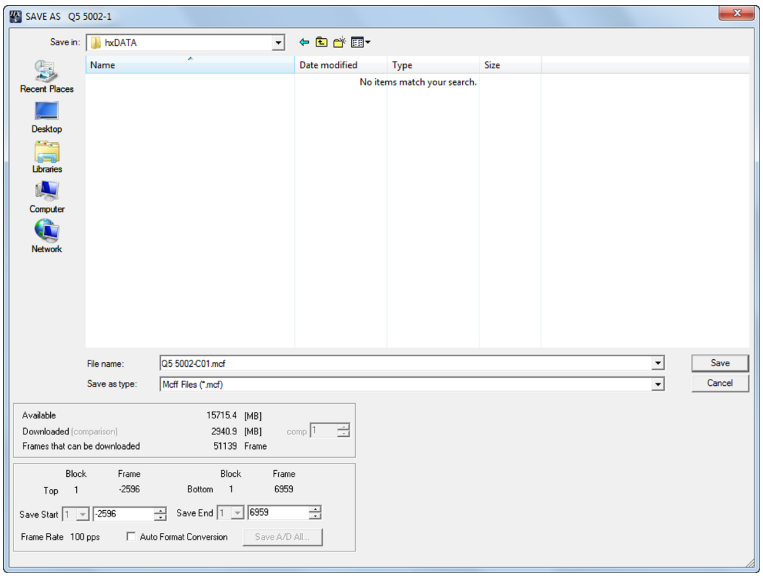
2 Select the camera head from the item list

Download

3 Click download



4 “Save As” is displayed

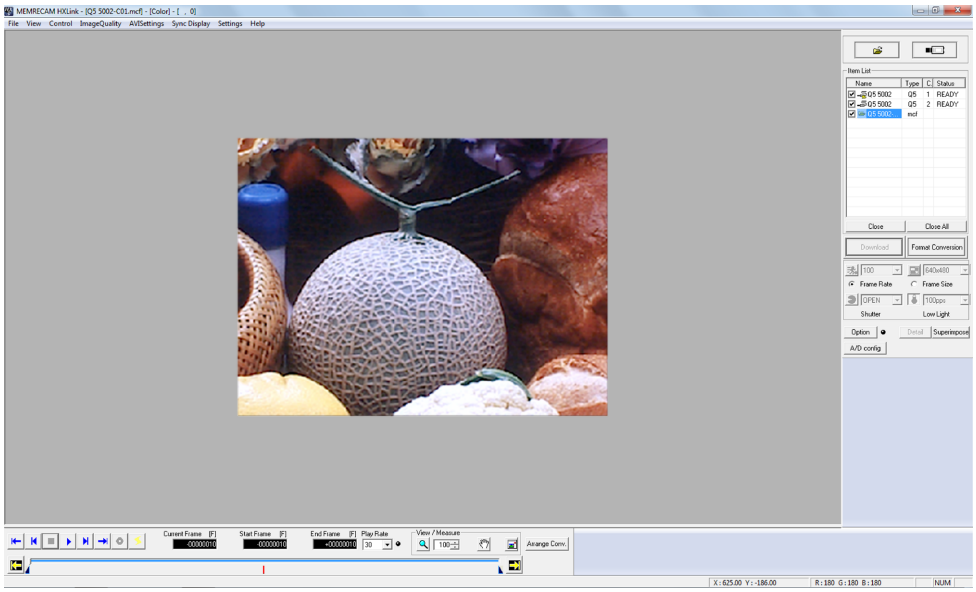


5 Click save to execute the save settings

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

6 The file name is displayed once saving has been completed

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



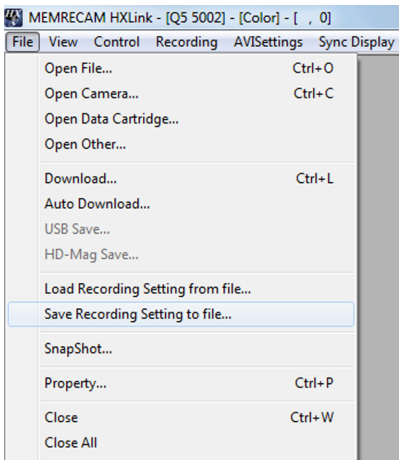
Load and Save Settings

Automatically load and save the Q5 settings to the PC.
Separate from this, if there is a need to keep the desired settings, save the settings and after connecting the next time, load these settings. Use this to save and load the settings for the camera.

Save the Settings

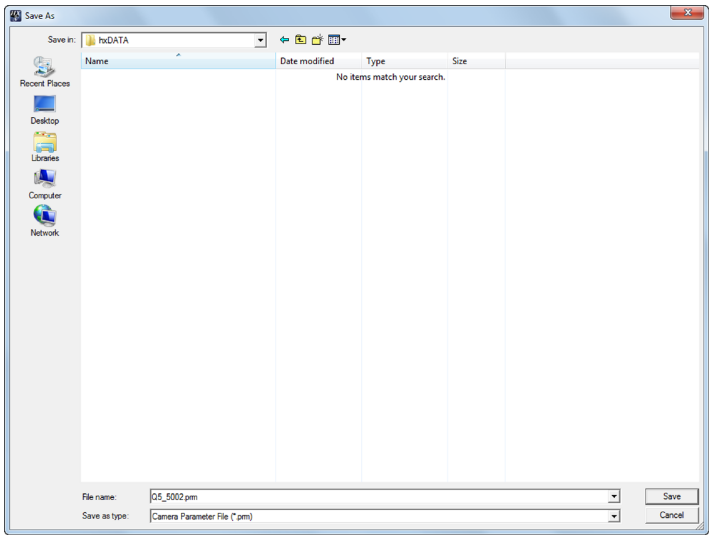
1 Select the save camera settings

- Select save camera settings from the file menu.



2 Input the settings file name and save

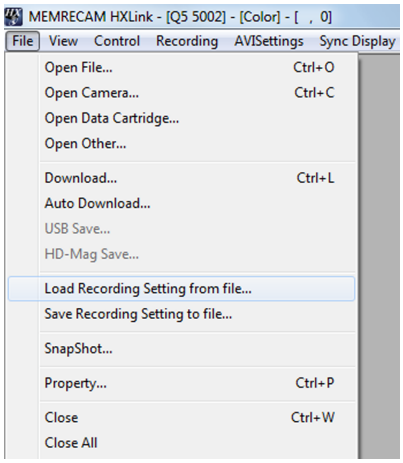
- Input the file name and save.



Load the Settings

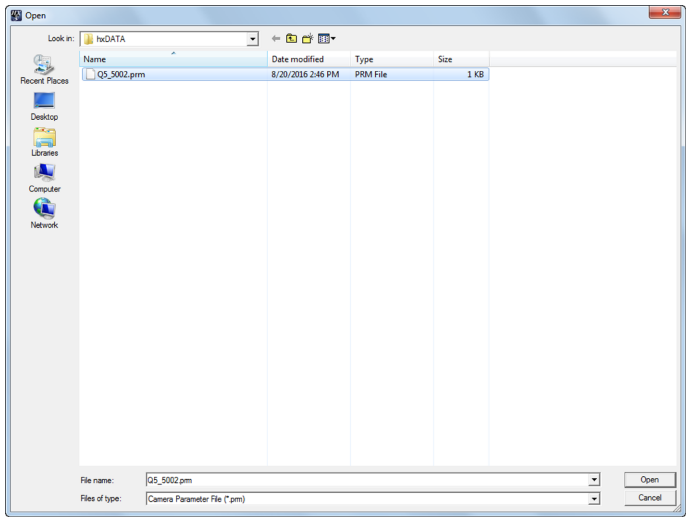
1 Select the camera settings to be loaded

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



2 Load the settings file

- Select the saved settings file to open.



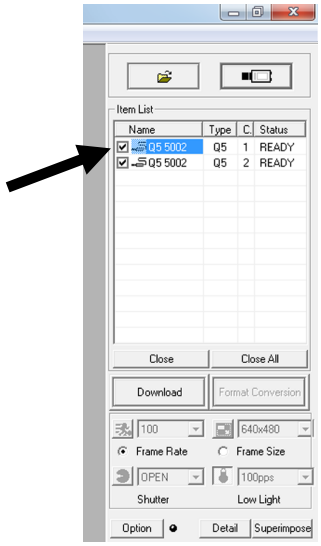
Disconnect the HXLink and Q5

Disconnect the Q5 and HXLink.

Disconnect

1 Select the camera to be disconnected from the item list

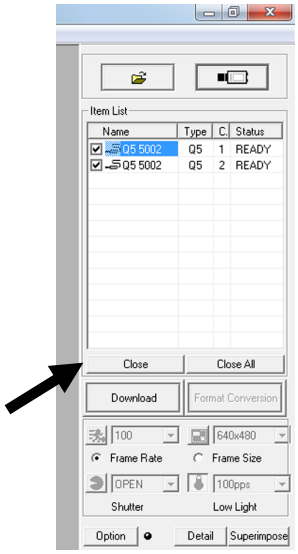
- Select the camera to be disconnected.



Close

2 Press close

- Press close under the item list.



• If “Close All” is pressed, all of the cameras and files on the item list will be disconnected and closed.

ResQ ADAPTER SYSTEM

If something abnormal occurs with the Q5, there are instances when the images on the camera can be saved externally.

If something abnormal occurs with the Q5, there are instances when the images on the camera can be saved on PC via USB by using the optional ResQ ADAPTER SYSTEM. Contact the store or our company for more information.

G Sensor Trigger

The Q5 has a G sensor trigger, where trigger input can occur by impact.

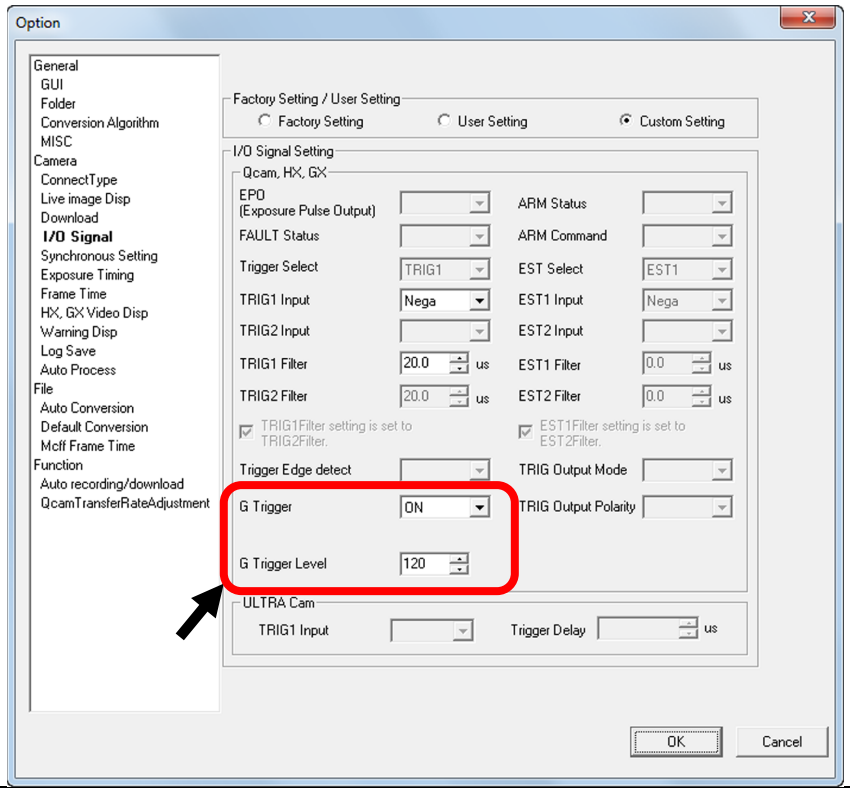
Attention
- The operating bandwidth for the G sensor is 1kHz.
- The internal G sensor detects values lower than the actual impact. When used, set the threshold with a margin of about 20%.
  Ex) With an impact environment of 150G → Threshold value: 120G
- According to test conditions, there are instances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

Set the G Sensor Trigger

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

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

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



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

4

Specifications

(00419)D

Camera Head

P2-Cam/S2-Cam

• The P2-Cam and S2-Cam use the same image sensor and the basic performance is the same.

Image Sensor (P2-Cam/S2-Cam)

Format	Approximately ½ inch CMOS sensor (color/BW)
Pixel Size	9.9 μm^2 pixels
Valid Pixels	640 × 480 pixels (300,000 pixels)
Maximum Area	6.34 × 4.75 mm
Precision Around the Optical Axis	±0.28mm

Frame Rate (P2-Cam/S2-Cam)

Preset Frame Rates	50、60、100、250、500、750、1,000、1,500、2,000、2,500、3,000、4,000、5,000、6,000、8,000、10,000、15,000、20,000、25,000、30,000、40,000、50,000、60,000、80,000、100,000 frames/sec

Attention
- There is no custom frame rate function.

Frame Rates and Valid Pixels (P2-Cam/S2-Cam)

Preset　　Maximum Frame Rate and Valid Pixels (Area)

Maximum Frame Rate Frames/Sec	Valid Pixels		Horizontal-Vertical Ratio (Size)	Valid Image Area (mm)	
	Horizontal	Vertical		Horizontal	Vertical
1,000 or less	640	480	VGA	6.34	4.75
1,000 or less	576	432	Split 4:3	5.70	4.28
1,500 or less	512	384	Split 4:3	5.07	3.80
2,000 or less	448	336	Split 4:3	4.44	3.33
2,500 or less	384	288	Split 4:3	3.80	2.85
4,000 or less	320	240	QVGA 4:3	3.17	2.37
6,000 or less	256	192	Split 4:3	2.53	1.90
10,000 or less	192	144	Split 4:3	1.90	1.43
15,000 or less	128	96	Split 4:3	1.27	0.95
50,000 or less	64	48	Split 4:3	0.63	0.48
100,000 or less	32	16	Split	0.32	0.16

Attention
- The number of pixels recorded in the memory is the same as the number of valid pixels.
- If selecting 250 (frames/sec) or less, there will be some image deterioration (a grainy image) due to the open shutter so covering the shutter should improve the image quality.
- 1,000pps or less refers to 50, 60, 100, 250, 500, 750, 1,000. The maximum length for a 50, 60 pps shutter time is 10ms.
- A combination of C-Cam and μ-Cam is only operational with the presets for C-Cam and μ-Cam.
- A combination of μ-Cam in 640*480 fixation, 1,000 (frames/sec) or less is worked.

Presets (P2-Cam/S2-Cam)

Frame Rate (pps)	Frame Size										
	32 × 16	64 × 48	128 × 96	192 × 144	256 × 192	320 × 240	384 × 288	448 × 336	512 × 384	576 × 432	640 × 480
50	○	○	○	○	○	○	○	○	○	○	○
60	○	○	○	○	○	○	○	○	○	○	○
100	○	○	○	○	○	○	○	○	○	○	○
250	○	○	○	○	○	○	○	○	○	○	○
500	○	○	○	○	○	○	○	○	○	○	○
750	○	○	○	○	○	○	○	○	○	○	○
1,000	○	○	○	○	○	○	○	○	○	○	○
1,500	○	○	○	○	○	○	○	○	○		
2,000	○	○	○	○	○	○	○	○			
2,500	○	○	○	○	○	○	○				
3,000	○	○	○	○	○	○					
4,000	○	○	○	○	○	○					
5,000	○	○	○	○	○						
6,000	○	○	○	○	○						
8,000	○	○	○	○							
10,000	○	○	○	○							
15,000	○	○	○								
20,000	○	○									
25,000	○	○									
30,000	○	○									
40,000	○	○									
50,000	○	○									
60,000	○										
80,000	○										
100,000	○										

Attention
- A combination of C-Cam and μ-Cam is only operational with the presets for C-Cam and μ-Cam.
- A combination of μ-Cam in 640*480 fixation, 1,000 (frames/sec) or less is worked.

Sensitivity （P2-Cam/S2-Cam）

Color	Approximately 6,000 lx （ISO1,000, F4, 1000 frames/sec, digital gain：NORMAL）
B/W	Approximately 1,500 lx （ISO4,000, F4, 1000 frames/sec, digital gain：NORMAL）

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

Shutter （P2-Cam/S2-Cam）

Shutter Format	Electronic shutter
Shutter Time Settings Method	Select from presets ／ Custom settings
Presets	OPEN、1/100、1/250、1/500、1/1,000、1/2,000、1/5,000、1/10,000、1/20,000、1/50,000、1/100,000、1/200,000、1/333,333
Custom Settings	1～9,996μs（＝10ms＝1/100s）　（Varies according to the frame rate）

Shutter with Fixed Settings for Exposure Time (Ex　if 640×480 pixels)

Exposure Time (sec)	Frame Rate (pps)						
	50	60	100	250	500	750	1000
1/50	×	×	×	×	×	×	×
1/60	×	×	×	×	×	×	×
1/100	○	○	○※	×	×	×	×
1/250	○	○	○	○※	×	×	×
1/500	○	○	○	○	○※	×	×
1/750	△	△	△	△	△	○※	×
1/1,000	○	○	○	○	○	○	○※
1/1,500	△	△	△	△	△	△	△
1/2,000	○	○	○	○	○	○	○
1/5,000	○	○	○	○	○	○	○
1/10,000	○	○	○	○	○	○	○
1/15,000	○	○	○	○	○	○	○
1/50,000	○	○	○	○	○	○	○
1/100,000	○	○	○	○	○	○	○
1/200,000	○	○	○	○	○	○	○
1/333,333	×	×	×	×	×	×	×

Attention
- ○ refers to shutter speeds that can be set, × and △ refer to shutter speeds that cannot be set with the presets.
- △ refers to custom shutter settings. × means that custom shutter settings are not possible.
- ※ refers to the shutter open (= 1 ／frame rate).
- If the frame rate or number of pixels are changed so the shutter speed cannot be set, the shutter is open or at the minimum exposure time. With the shutter open or the minimum exposure time, these settings remain even if the frame rate or number of pixels are changed.
- With a shutter setting of 1/333,333 sec, the number of horizontal pixels is 608 or less。
- Even if the shutter exposure time settings are shown on the menu, there may be instances where settings cannot be made due to the recording conditions or the combination of cameras (P2-Cam, S2-Cam, C-Cam, μ-Cam). In this case, the setting for the shutter exposure time reverts to that of before the change.

Range of Settings and Intervals for Exposure Times that can be Set

Frame Rate (pps)	Pixels (width x height)	Settings (μs)		Setting Intervals (μs)
		Max	Min	
100 or less	640x480	9996	4	1 or 2
250	640x480	3996	4	1 or 2
500	640x480	1995	4	1 or 2
1,000	640x480	997	4	1 or 2
2,000	448x336	497	3	1 or 2
2,500	384x288	329	2	1 or 2
4,000	320x240	246	2	1
6,000	256x192	163	2	1
10,000	192x144	96	1	1
15,000	128x96	63	1	1
50,000	64x48	17	1	1
100,000	32x16	7	1	1

Attention
- The control software automatically calculates the exposure times that can be set in the custom settings.

Cable Length (P2-Cam/S2-Cam)

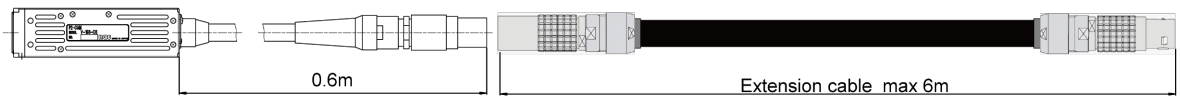
CHECK • Various cable lengths can be used for each camera head.

Attention • There is one extension cable in only 4m or 6m that can be used with the camera head and BB1 UNIT.

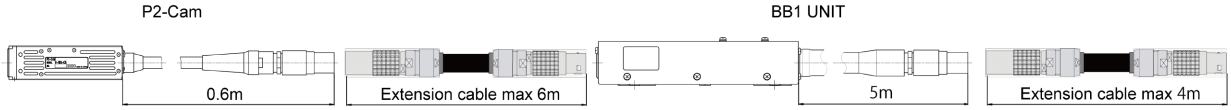
• The BB1 UNIT cannot be used if the Q5 is connected to the Q-HUB.

P2-Cam

Extension Cable	Approximately 6.6 m Camera head cable 0.6m + extension cable 6m

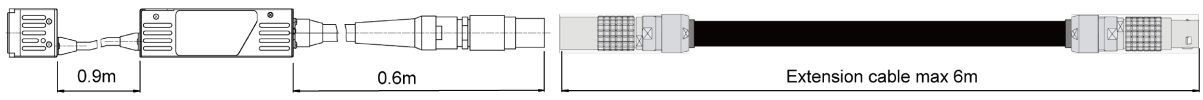


BB1 UNIT	Approximately 15.6 m Camera head cable 0.6m + extension cable 6m +BB1 UNIT 5m + extension cable 4m

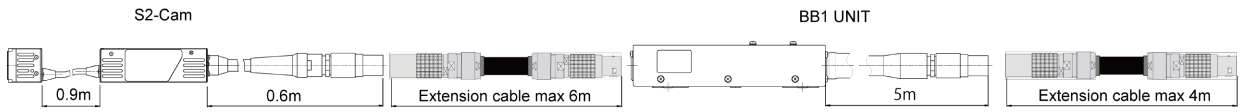


S2-Cam

Extension Cable	Approximately 7.5 m Camera head cable 0.9m + 0.6m + extension cable 6m



BB1 UNIT	Approximately 16.5 m Camera head cable 0.9m + 0.6m + extension cable 6m +BB1 UNIT 5m + extension cable 4m



Lens Mount (P2-Cam/S2-Cam)

Type of Mount	NF Mount
	C Mount (Optional NF-C mount conversion adapter)
	SPM lens (nac G resistant lens, P2-Cam/S2-Cam)

Attention
- The P2-Cam/S2-Cam are designed for the dedicated NF Mount. If using a mount that is not the NF mount but has a lens and adapter (C Mount, F Mount or such), there is a concern that the mount might break.
- If replacing the NF mount and SPM lens, back adjustment is necessary.

C-Cam

Image Sensor (C-Cam)

Format	Approximately ½ inch CMOS sensor (color/BW)
Pixel Size	11.2 μm^2 pixels
Valid Pixels	640 × 480 pixels (300,000 pixels)
Maximum Area	7.17 × 5.38 mm
Precision Around the Optical Axis	±0.33mm

Frame Rate (C-Cam)

Preset Frame Rates	50、60、100、250、500、750、1,000、1,500、2,000、2,500、3,000、4,000、5,000、6,000、8,000、10,000、15,000、20,000、25,000 frames/sec

Attention • There is no custom frame rate function.

Frame Rates and Valid Pixels (C-Cam)

Preset Maximum Frame Rate and Valid Pixels (Area)

Maximum Frame Rate Frames/Sec	Valid Pixels		Horizontal-Vertical Ratio (Size)	Valid Image Area (mm)	
	Horizontal	Vertical		Horizontal	Vertical
1,000 or less	640	480	VGA	7.17	5.38
1,000 or less	576	432	Split 4:3	6.45	4.84
1,500 or less	512	384	Split 4:3	5.73	4.30
2,000 or less	448	336	Split 4:3	5.02	3.76
2,500 or less	384	288	Split 4:3	4.30	3.23
4,000 or less	320	240	QVGA 4:3	3.58	2.69
5,000 or less	256	192	Split 4:3	2.87	2.15
8,000 or less	192	144	Split 4:3	2.15	1.61
10,000 or less	128	96	Split 4:3	1.43	1.08
15,000 or less	64	48	Split 4:3	0.72	0.54
25,000 or less	32	16	Split	0.36	0.18

Attention
- The number of pixels recorded in the memory is the same as the number of valid pixels.
- If selecting 250 (frames/sec) or less, there will be some image deterioration (a grainy image) due to the open shutter so covering the shutter should improve the image quality.
- 1,000pps or less refers to 50, 60, 100, 250, 500, 750, 1,000. The maximum length for a 50, 60 pps shutter time is 10ms.
- If selecting 250pps or less when using the C-Cam, there will be some image deterioration (a grainy image) due to the open shutter so covering the shutter should improve the image quality.
- A combination of μ-Cam in 640*480 fixation, 1,000 (frames/sec) or less is worked.

Presets (C-Cam)

Frame Rate (pps)	Frame Size										
	32 × 16	64 × 48	128 × 96	192 × 144	256 × 192	320 × 240	384 × 288	448 × 336	512 × 384	576 × 432	640 × 480
50	O	O	O	O	O	O	O	O	O	O	O
60	O	O	O	O	O	O	O	O	O	O	O
100	O	O	O	O	O	O	O	O	O	O	O
250	O	O	O	O	O	O	O	O	O	O	O
500	O	O	O	O	O	O	O	O	O	O	O
750	O	O	O	O	O	O	O	O	O	O	O
1,000	O	O	O	O	O	O	O	O	O	O	O
1,500	O	O	O	O	O	O	O	O	O		
2,000	O	O	O	O	O	O	O	O			
2,500	O	O	O	O	O	O	O				
3,000	O	O	O	O	O	O					
4,000	O	O	O	O	O	O					
5,000	O	O	O	O	O						
6,000	O	O	O	O							
8,000	O	O	O	O							
10,000	O	O	O								
15,000	O	O									
20,000	O										
25,000	O										

Attention • A combination of μ-Cam in 640*480 fixation, 1,000 (frames/sec) or less is worked.

Sensitivity (C-Cam)

Color	Approximately 750 lx (ISO8,000, F4, 1000 frames/sec, digital gain : NORMAL)
B/W	Approximately 120 lx (ISO50,000, F4, 1000 frames/sec, digital gain : NORMAL)

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

Shutter (C-Cam)

Shutter Format	Electronic shutter
Shutter Time Settings Method	Select from presets ／ Custom settings
Presets	OPEN, 1/100, 1/250, 1/500, 1/1,000, 1/2,000, 1/5,000, 1/10,000, 1/20,000, 1/50,000
Custom Settings	14～9,993μs (= 10ms = 1/100s)　(Varies according to the frame rate)

Shutter with Fixed Settings for Exposure Time (Ex　if 640×480 pixels)

Exposure Time (sec)	Frame Rate　(pps)						
	50	60	100	250	500	750	1000
1/50	×	×	×	×	×	×	×
1/60	×	×	×	×	×	×	×
1/100	○#	○#	○※#	×	×	×	×
1/250	○#	○#	○#	○※#	×	×	×
1/500	○	○	○	○	○※	×	×
1/750	△	△	△	△	△	○※	×
1/1,000	○	○	○	○	○	○	○※
1/1,500	△	△	△	△	△	△	△
1/2,000	○	○	○	○	○	○	○
1/5,000	○	○	○	○	○	○	○
1/10,000	○	○	○	○	○	○	○
1/20,000	○	○	○	○	○	○	○
1/50,000	○	○	○	○	○	○	○

Attention
- ○ refers to shutter speeds that can be set, × and △ refer to shutter speeds that cannot be set with the presets.
- △ refers to custom shutter settings. × means that custom shutter settings are not possible.
- ※ refers to the shutter open (＝ 1 ／frame rate).
- # refers to the image deterioration that occurs with the shutter open (grainy image) so cover the shutter to improve the image quality.
- If the frame rate or number of pixels are changed so the shutter speed cannot be set, the shutter is open or at the minimum exposure time. With the shutter open or the minimum exposure time, these settings remain even if the frame rate or number of pixels are changed.
- Designate a priority for frame rate or frame size.
- Even if the shutter exposure time settings are shown on the menu, there may be instances where settings cannot be made due to the recording conditions or the combination of cameras (P2-Cam, S2-Cam, C-Cam, μ-Cam). In this case, the setting for the shutter exposure time reverts to that of before the change.

Range of Settings and Intervals for Exposure Times that can be Set

Frame Rate (pps)	Pixels (width x height)	Settings (μs)		Setting Intervals (μs)
		Max	Min	
100 or less	640x480	9993	18	2 or 3
250	640x480	3993	16	2 or 3
500	640x480	1993	16	2 or 3
1,000	640x480	993	16	2 or 3
2,000	448x336	493	16	2 or 3
2,500	384x288	393	16	2 or 3
3,000	320x240	327	17	2 or 3
5,000	256x192	193	16	2 or 3
8,000	192x144	118	16	2 or 3
10,000	128x96	93	16	2 or 3
15,000	64x48	60	15	2 or 3
25,000	32x16	33	16	2 or 3

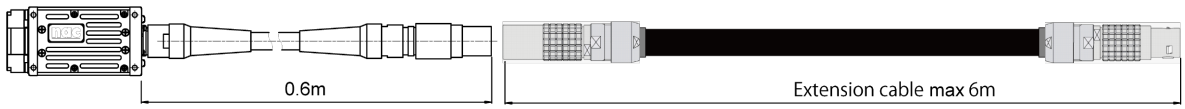
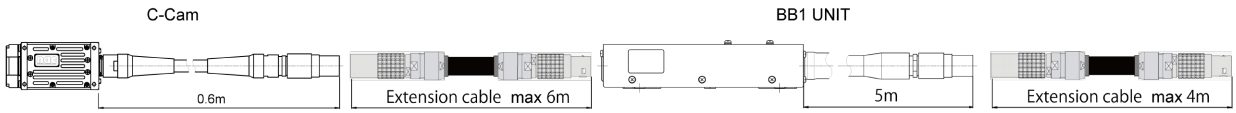
Attention
- The control software automatically calculates the exposure times that can be set by the custom shutter.

Cable Length (C-Cam)

CHECK • Various cable lengths can be used for each camera head.

Attention • There is one extension cable in only 4m or 6m that can be used with the camera head and BB1 UNIT.
• The BB1 UNIT cannot be used if the Q5 is connected to the Q-HUB.

C-Cam

Extension Cable	Approximately 6.6 m Camera head cable 0.6m + extension cable 6m
	
BB1 UNIT	Approximately 15.6 m Camera head cable 0.6m + extension cable 6m +BB1 UNIT 5m + extension cable 4m
	

Lens Mount (C-Cam)

Type of Mount	C Mount

Precautions for Use (C-Cam)

Without a tripod plate or a camera holder, the temperature range for use is up to 30℃.

If used in environments higher than this, please use a tripod plate or camera holder.

μ-Cam

Image Sensor (μ-Cam)

Format	Approximately ½ inch CMOS sensor (color/BW)
Pixel Size	7.4 μm^2 pixels
Valid Pixels	640 × 480 pixels (300,000 pixels)
Maximum Area	4.74 × 3.55 mm
Precision Around the Optical Axis	±0.165mm

Frame Rate (μ-Cam)

Preset Frame Rates	100、250、500、1,000 コマ／秒

Attention • There is no custom frame rate function.

Frame Rates and Valid Pixels (μ-Cam)

Preset Maximum Frame Rate and Valid Pixels (Area)

Maximum Frame Rate Frames/Sec	Valid Pixels		Horizontal-Vertical Ratio (Size)	Valid Image Area (mm)	
	Horizontal	Vertical		Horizontal	Vertical
100	640	480	VGA	4.74	3.55
250	640	480	VGA	4.74	3.55
500	640	456	Split	4.74	3.37
1,000	640	210	Split	4.74	3.37
1,000 (Advanced sampling mode)	640	416	Split	4.74	3.08

CHECK • With the advanced sampling mode, compression transfer is performed on each b/w line and every 2 color lines of a 416 vertical pixel image to get 210 lines of data. Because of image complementing, the resolution is reduced.

• In the advanced sampling mode, the HXLink live display is an image compressed to 210 vertical lines. Download the MCFF and playback on the HXLink to verify the recorded image.

Attention • The number of pixels recorded in the memory is the VGA size of (640 (H) × 480 (H)).

Presets (μ-Cam)

Frame Rate (pps)	Frame Size			
	640 × 210	640 × 416	640 × 456	640 × 480
100	×	×	×	○
200	×	×	×	○
500	×	×	○	×
1000	○	×	×	×
1000 (Advanced Sampling Mode)	×	○	×	×

Sensitivity (μ-Cam)

Color	Approximately 3,000 lx (ISO2,000, F4, 1000 frames/sec, digital gain : NORMAL)
B/W	Approximately 750 lx (ISO8,000, F4, 1000 frames/sec, digital gain : NORMAL)

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

Shutter (μ-Cam)

Shutter Format	Electronic shutter
Shutter Time Settings Method	Select from presets ／ Custom settings
Presets	OPEN, 1/100, 1/250, 1/500, 1/750, 1/1,000, 1/1,500, 1/2,000, 1/5,000, 1/10,000, 1/20,000
Custom Settings	56～9,946μs (= 10ms = 1/100s) (Varies according to the frame rate)

Shutter with Fixed Settings for Exposure Time (Ex　if 640×480 pixels)

Exposure Time (sec)	Frame Rate　(pps)			
	100	250	500	1000
1/100	○※	×	×	×
1/250	○	○※	×	×
1/500	○	○	○※	×
1/750	△	△	△	×
1/1,000	○	○	○	○※
1/1,500	△	△	△	△
1/2,000	○	○	○	○
1/5,000	○	○	○	○
1/10,000	○	○	○	○
1/20,000	×	×	×	×

Attention
- ○ refers to shutter speeds that can be set, × and △ refer to shutter speeds that cannot be set with the presets.
- △ refers to custom shutter settings. × means that custom shutter settings are not possible.
- ※ refers to the shutter open (＝ 1 ／frame rate).
- If the frame rate or number of pixels are changed so the shutter speed cannot be set, the shutter is open or at the minimum exposure time. With the shutter open or the minimum exposure time, these settings remain even if the frame rate or number of pixels are changed.
- Designate a priority for frame rate or frame size.
- Even if the shutter exposure time settings are shown on the menu, there may be instances where settings cannot be made due to the recording conditions or the combination of cameras (P2-Cam, S2-Cam, C-Cam, μ-Cam). In this case, the setting for the shutter exposure time reverts to that of before the change.

Range of Settings and Intervals for Exposure Times that can be Set

Frame Rate (pps)	Pixels (width x height)	Settings (μs)		Setting Intervals (μs)
		Max	Min	
100	640x480	9946	56	1
250	640x480	3946	56	1
500	640x456	1946	56	1
1,000	640x210	946	56	1
1,000 (Advanced Sampling Mode)	640x416	946	56	1

Attention

- The control software automatically calculates the exposure times that can be set by the custom shutter.
- The interval can be set at 1μs but 8～9μs is possible for actual operation with the camera specifications.

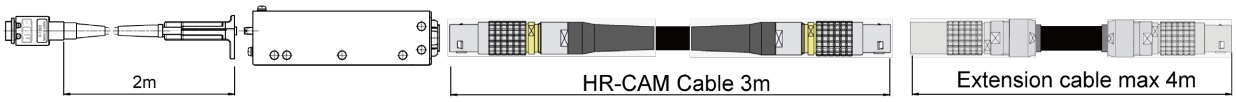
Cable Length (μ-Cam)

CHECK • Various cable lengths can be used for each camera head.

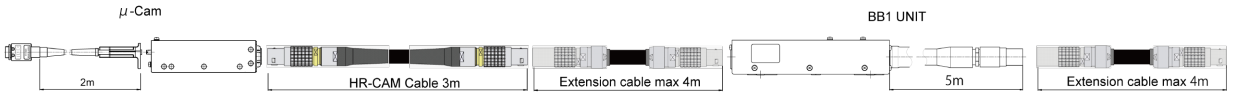
Attention • There is one extension cable in only 4m that can be used with the camera head and BB1 UNIT.
• The BB1 UNIT cannot be used if the Q5 is connected to the Q-HUB.

μ-Cam

Extension Cable	Approximately 9 m Camera head cable 2m + HR-CAM cable 3m + extension cable 4m



BB1 UNIT	Approximately 18 m Camera head 2m + HR-CAM cable 3m + extension cable 4m + BB1 UNIT 5m + extension cable 4m



Lens Mount (μ-Cam)

Type of Mount	M10.5 P0.5

Precautions for Use (μ-Cam)

Install a camera head mounting plate for use.

Recorder (Q5)

Recording Memory Capacity

Packaged Memory Capacity	8GB
Memory Segment Division	266MB×32, 532MB×16, 1.0GB×8, 2.1GB×4, 4.2GB×2, 8.5GB×1

# of Camera Heads	# of Memory Segments and Segment Size					
	1	2	4	8	16	32
1	8.5GB	4.2GB	2.1GB	1.0GB	533MB	266MB
2	4.2GB	2.1GB	1.0GB	533MB	266MB	-
3	2.8GB	1.4GB	711MB	355MB	-	-
4	2.1GB	1.0GB	533MB	266MB	-	-

Attention • Since the segment sizes are divided equally, it is not possible to set the size for each segment.

Recording Bit Length

Image Sensor Output	10 bits	
Recording bits per pixel	Select from 8／10 bits	
	10 bits :	Records with 10 bit image sensor output. Records (standard image quality)
	8 bits :	Records by compressing the 10 bit image sensor output as follows (extended recordings, data size reduction) 0～127 unchanged 128～255 were at 128～191. 256～511 were at 192～223. 512～1023 were at 224～255.

Live Image Output (Using HXLink)

Output Format	PC live output with Ethernet GigE Vison Raw data of images the PC receives from MEMRECAM is converted to images for display	
Refresh Rate	Depends on the PC performance, network status and the recording resolution (initial settings) ・Approximately 20 frames/sec With 1 camera head and resolution of 640×480	
Gradation	RGB each 8bit	
Image Quality Settings	Digital Gain	LOW, NORMAL, HIGH
	White Balance	AUTO, 3,100K, 5,000K, 9,000K, REG
	Enhance	OFF, LOW, NORMAL, HIGH
	Gamma	OFF, LOW, NORMAL
	Chroma	0%, 50%, 100%, 150%, 200%
	Knee	OFF, ON
	RGB Matrix+	OFF, ON
	Luminance	NORMAL, LINEAR, TABLE, CUSTOM
Display Range	Zoom	Magnification (%) by integer, or show entire image
	Scroll	Show zoomed image in displayed area
Screen Center Mark	Show, Hide	
Playback	Frame rate	Fast forward, 1～1920 frames/sec, forward or reverse
	Jump frames	Trigger point, recording start point, recording end point
	Playback mode	Single playback, loop playback
	Set playback range	Set starting and ending points
Show Warnings	Show warnings on HXLink when generated Abnormal start/Cancel recording Abnormal input voltage (Low voltage : 19V or less) Abnormal input voltage (High voltage : 33V or more) Trigger signal alert when starting VIEW/ARM Startup error Abnormal voltage : Image memory outage, or abnormal image memory initial setting Backup battery dead / Abnormal voltage / Outage (ON/OFF possible) Camera disconnected when LOCAL ETHERNET cable connected Thermal shutdown	

Recording Format

Recording Format	Overwrite recording to the memory configured of a ring buffer

Recording Conditions

Recording Start Conditions	ARM Command (ARM from HXLink or such)
Recording End Conditions	Recording Trigger Vibration (IF connector TRIG IB) REC Command (Network : REC from HXLink or such) G Sensor Trigger (detection of impact by acceleration sensor) ＜Stop Command＞ Q5 recording automatically ends when abnormal temperature is generated.

Recording Trigger Mode

Normal Trigger	Normal recording trigger

Trigger Timing

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

Simultaneous Recording Data

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

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

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

※Time Stamp : Simultaneous recording data for each frame

System Control

Main Unit Switch

Power Switch	Slide (ON/OFF) Powered operation possible with PWRCNT signals when the power is ON

Status LED

5 LEDs on the front panel of the Q5 that show the status

L (LOCAL ETHERNET) Shows the connection status of the local Ethernet cable	Lit green : Not lit :	Local ethernet connected Local ethernet not connected or the power is OFF.
M (MODE) Shows the Q5 mode	Orange : Blue : White : Magenta : Not lit : Flashing :	REC mode (Camera image output, saving camera image in memory after trigger detection) STOP/READY mode (Memory image output. Play or fast forward mode immediately after startup) VIEW mode (Camera image output, memory contents retained for finished recordings) ARM mode (Camera image output, eliminating memory contents for finished recordings and saving camera images in the memory) Power OFF, or starting up Set to EST mode and EST pulse is input. Only for, VIEW, ARM, REC mode.
S (STATUS) Power ON, show fail status	Green : Red : Flashing red : Not lit :	Normal status Fail status (Abnormal power voltage detected) Fail status (Elevated DRP temperature detected) Flashing slow : Warning temperature Flashing fast : Dangerous temperature (cannot execute VIEW, ARM) Power OFF or starting up
E (ETHER) Show Ethernet connection status	Flashing green : Orange : Not lit : ※If transmitting by linking with 1000BASE-T, the orange is lit and the same LED flashes green, but the flashing green is darker than the lit orange so it is difficult to see.	Network connection with 100BASE-TX Network connection with 1000BASE-T Network not connected or power OFF

B (BATT) ・Show memory backup status ・Show thermal shutdown	Lit green : Flashing green : Lit orange : Flashing orange : Lit red : Flashing red : Not lit : Alternating red and green :	Backing up with external power, battery (Charge H) Backing up with battery (Charge H) Backing up with external power, battery (Charge M) Backing up with battery (Charge M) Backing up with external power, battery (Charge L) Backing up with battery (Charge L) Backup OFF Thermal shutdown

CHECK • When thermal shut down occurs, let you turn on the power switch of Q5 again after turning off the power supply of the AC adapter in becoming invalid and return.

PORT LED

Shows the connection status for the camera heads with LED for each camera port.

Display Color, Status	Is Filming Possible?	Camera Head Status	Port Status (Setting)
Not lit	-	Before startup	-
Flashing green (fast)	-	Starting up	-
Flashing orange (slow)	△	Can be used	Not enabled
Flashing orange (fast)	×	Not connected	Enabled
Orange	×	Not connected	Not enabled
Green	○	Can be used	Enabled
Flashing red (fast)	×	Cannot be used	Not enabled
Red	×	Cannot be used	Not enabled

CHECK • If there is a △ and an indication of 'can be used', it is possible to use the camera head connected if the camera configuration is set.

Memory Backup

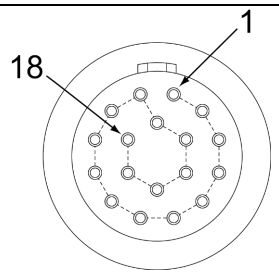
Function	Protects images just recorded when the power switch is turned OFF accidentally after recording is finished or protects the contents of the recorded images when the power cable is disconnected and the power is cut off during recording.
Battery	Battery used : Nickel hydride battery Model : 4 x 2 units Nominal capacity : 500mAh Nominal voltage : 2.4V Life : 1 year (Target replacement of 1 year due to major changes in the ambient temperature or operating environment)
Backup Time	About 1 hour (if using a new battery)
Backup Start Conditions	Q5 power is OFF after starting recording
Battery Backup Start Conditions	DC input voltage to Q5 is 19.0V or less after starting recording
Charge Time	About 4 hours (from completely discharged state to fully charged state)
Charge Start Conditions	If the main unit is supplied by external power (AC adapter or such)
Battery Status Display	Display by LED B on the front panel Red : low charge Orange : medium charge Green : full charge
Battery replacement	Approximately 1 year with normal use (charging multiple times per day at normal temperatures), but life varies according to storage temperature, number of charges, continuous time for charging and such. There may be times when the time before the red LED flashes shortens in spite of sufficient charging and may interfere with use. Avoid using and storing in environments with high temperatures to extend the life of your battery.
Cancellation of backup memory	Changing the memory segment size cancels the backup memory.

Attention • Changing the memory segment size cancels all of the image data in the memory. Make sure to save essential data to a PC before changing.

Input/Output Connectors

IF Connector

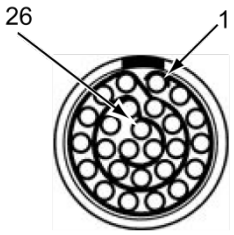
Application	Q5 power input, Ethernet connection, EST input, trigger input, EPO output, power control	
Model	LEMO ECA.2B.318	
Plug	LEMO FGA 2B.318	
ETHER	1000BASE-T (IEEE802.3ab) insulator	
SYNC IN	Signal Level :	CMOS level, 5V pull-up, insulator L level : -0.5VDC (minimum applied voltage) ～ 1.2VDC H level : 3.6VDC ～ 5.5VDC (maximum applied voltage) IRIG-B is DCLS (analog input not possible)
	Function :	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
DC IN	Power voltage :	DC 20～32V
	Input power :	DC power (AC adapter, external battery etc)
	Power consumption :	About 50W (4 μ-Cam connected, ARM MODE, DC24V)
	Power protection :	Reverse polarity With internal protection IC Overvoltage With internal protection IC, shutdown at 35VDC.
	Minute remote power control function	
TRIG	Signal level :	CMOS level, 5V pull-up, insulator L level : -0.5VDC (minimum applied voltage) ～ 1.2VDC H level : 3.6VDC ～ 5.5VDC (maximum applied voltage)
	Function :	Trigger functions with H→L, polarity inverting function

SYNC OUT	Signal level :	5VCMOS output, insulator
	Function :	Falling (H → L) : Start exposure Signal level : 5VCMOS output, insulator
	Function :	Falling (H → L) : Start exposure (EPO output setting) Rising (L → H) :End exposure (EPO output setting) No polarity inverting function
PWRCTL	Signal level :	CMOS level, 5V pull-up, insulator L level : -0.5VDC (minimum applied voltage) ～ 1.2VDC H level : 3.6VDC ～ 5.5VDC (maximum applied voltage)
	Function :	H : Power ON L : Power OFF No polarity inverting function
Pin Arrangement		

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	Insulator
10	SYNC IN RTN	IN	SYNC input signal return	Ground insulator
11	DC IN	IN	DC24V input	
12	DC IN RTN	IN	DC24V return	
13	TRIG IN	IN	CMOS, contact	Insulator
14	TRIG IN RTN	IN	TRIG input signal return	Ground insulator
15	SYNC OUT	OUT	CMOS	Insulator
16	SYNC OUT RTN	OUT	SYNC output signal return	Ground insulator
17	POWER CONT IN	IN	CMOS	Insulator
18	POWER CONT RTN	IN	POWET CONT input signal return	Ground insulator
shell	FRAME GND	—	Frame ground	

PORT Connector (PORT1～4)

Application	Camera head connection signal, camera head power
Model	LEMO EEG.3B.326
Plug	LEMO FGG 3B.326
Pin Arrangement	

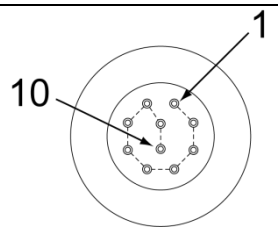
Pin Arrangement

Pin No.	Name	Direction	Function ・Input/Output Level	Notes
1	DTC+			
2	DTC -			
3	CTD0+			
4	CTD1+			
5	CTD1-			
6	CTD2+			
7	CTD2-			
8	CTD4+			
9	CTD4-			
10	CTD5+			
11	CTD5-			
12	CTD6+			
13	CTD7+			
14	CTD7-			
15	NC			
16	CTD0-			
17	NC			
18	CLK+			
19	CLK-			
20	NC			
21	NC			
22	CTD6-			
23	CTD3+			
24	CTD3-			
25	DC16V IN			
26	DC16V RTN			
shell	FRAME GND	—	Frame ground	

LOCAL ETHERNET Connector

Application	For Ethernet connection
Model	LEMO EEG.1B.310
Plug	LEMO FGG 1B.310

Pin Arrangement



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	STATUS1	I/O	Connect Check	
10	STATUS2	I/O	Connect Check	

ARM OUT Connector

Application	ARM status output	
Model	JC BNCJ-MICRO-V-PC	
Plug	JC BNCP-MICRO-CBL-1855A	
ARM OUT	Signal level :	Open collector output
		Withstand pressure 50V, maximum current 100mA
	Function :	Return signal and short circuit in the ARM mode
		No polarity inverting function

Pin Arrangement

Pin No.	Name	Direction	Function ・Input/Output Level	Notes
1	ARM	OUT		
2	ARM RTN	OUT		

Shape, Environment, Precision, Application Standards, Supplies

Q5

Shape

Exterior dimensions (W×H×D)	Approximately W195 × H40 × D125mm (Excluding connector and protruding parts)
Main unit weight	Approximately 1.8kg (Q5 unit only. Excluding cable, camera head and such)
Mounting screws	4 each M6 depth of 6mm on the top, bottom, left and right 4 M4 depth of 6mm on the front and 8 on the back
Power consumption	Approximately 28W (Q5 main unit) Approximately 50W (4 μ-Cam connected)

Environment

Operating temperature and humidity	0～40℃, 30～80%RH (no condensation)
Storage temperature and humidity	-10～60℃, 20～80%RH (no condensation)
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE 514.2-2A
Impact	Half sine, 11msec, 150G, Half sine, 7msec, 200G 6 shaft Total of 1,000 times

Precision

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

Application Standards

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

Supplies

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

μ-Cam

Shape

Exterior dimensions (W×H×D)	Excluding lens, cable, mounting plate, fittings ・Camera head Side type：Approximately W15×H16×D16mm Straight type：Approximately W16×H16×D27mm ・RELAY BOX Approximately W30×H30×D100mm
Main unit weight	・Camera head Side type： Approximately 70g (no mounting plate) ／ Approximately 75g (with mounting plate) Straight type： Approximately 70g (no mounting plate) ／ Approximately 77g (with mounting plate) ・RELAY BOX Approximately 200g
Cable	・Camera head Pigtail construction, length of 2m, diameter of 3.7mm ・RELAY BOX HR CAM cable used for connection. Lengths of 3m, 4m, 5m Diameter of 8.8mm
Mounting screws	・Camera head Head：M2：Depth of 2mm Side type 4 locations on the bottom and back Straight type 4 locations on the bottom ・RELAY BOX None
Power consumed	Approximately 1.2W Camera head Approximately 5.5W Camera head + RELAY BOX + camera cable 5m
Camera head with mounting plate	Attached to the camera head Side type：External dimensions Approximately W32×H3×D25mm Holes for mounting: Diameter of 4.3mm (2 locations) Straight type：External dimensions Approximately 32×H3×D27.5mm Holes for mounting: Diameter of 4.3mm (2 locations)

Connector	・Camera head (cable) ：HTK　　HDR26P Male ・RELAY BOX (DRP side) LEMO ECG.2B.326 (Head side) HTK　HDR26P Female
Lens Mount	M10.5　Pitch 0.5

Attention • The camera head connector (HTK　HDR26P male) is the same as the Mini Camera Link but the standards differ so do not plug into the PCのCamera Link board.

Environment

Operating temperature and humidity	0～40℃, 30～80%RH (no condensation)
Storage temperature and humidity	-10～60℃, 20～80%RH (no condensation)
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE)　FIGURE514.2-2A
Impact	・Camera head : Half sine, 11msec, 150G, 6 shafts Total of 1,000 times ・RELAY BOX : Half sine, 11msec, 150G (but only 100G in the direction the connector is removed), when using fitting, 6 shafts Total of 1,000 times

C-Cam

Shape

Exterior dimensions (W×H×D)	Excluding lens, cable, mounting plate, fittings Side type：Approximately W57×H35×D35mm Straight type：Approximately W35×H35×D58mm
Main unit weight	・Only main unit of camera head Side type：Approximately 120g Straight type：Approximately 140g ・Main unit of camera head＋standard cable Side type：Approximately 250g Straight type：Approximately 270g
Cable	Pigtail construction, length of approximately 0.6m, diameter of 8.8mm
Mounting screws	・Head：M3：Depth of 4mm Side type　5 locations on the top and bottom; 4 locations on the side and back Straight type　4 locations on the top and bottom and sides
Power consumed	Approximately 5.3W
Lens mount	C Mount

Environment

Operating temperature and humidity	0～40℃, 30～80%RH (no condensation) (31～40℃ when using a tripod plate or camera holder mount)
Storage temperature and humidity	-10～60℃, 20～80%RH (no condensation)
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
Impact	Half sine, 11msec, 150G, 6 shafts Total of 1,000 times

S2-Cam

Shape

Exterior dimensions (W×H×D)	Excluding lens, cable, mounting plate, tripod plate Straight type / side type Imager Approximately W25×H25×D25mm Interface Approximately W25×H25×D80mm
Main unit weight	Approximately 270g (including cable) Imager Approximately 30g Interface Approximately 125g
Cable	・Camera head－interface Pigtail construction Length of approximately 0.9m, Diameter of approximately 3.8mm ・Interface Pigtail construction Length of approximately 0.6m, Diameter of approximately 8.8mm
Mounting screws	・Camera head M2：Depth of 5mm 2 locations on the top and bottom ・Interface None
Tripod mounting screws	Used with the optional tripod plate 1/4-20UNC Depth of 6mm
Power used	Approximately 3.8W
Lens mount	NF mount C mount (Used with the optional NF-C mount convertible adapter. Cannot be used with mounting fittings and the tripod plate) SPM lens (option nac dedicated G resistant lens S2-Cam/P2-Cam)

Attention • The optional NF-C mount convertible adapter is not warrantied for environments with vibration or impact.

Environment

Operating temperature and humidity	0～40℃, 30～80%RH (no condensation) (31～40℃ when using a tripod plate or camera holder mount)
Storage temperature and humidity	-10～60℃, 20～80%RH (no condensation)
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE514.2-2A
Impact	Half sine, 11msec, 150G, 6 shafts Total of 1,000 times

Application Standards

Electromagnetic compatibility	KN32, KN35

P2-Cam

Shape

Exterior dimensions (W×H×D)	Excluding lens, cable, mounting plate, tripod plate SS type Approximately W25×H25×D85mm SA type Approximately W25×H25×D88mm SA type Approximately W25×H25×D94mm SA type Approximately W25×H25×D97mm
Main unit weight	・Only camera head Approximately 100g ・Main unit of camera head＋standard cable Approximately 230g
Cables	Pigtail construction Length of approximately 0.6m, Diameter of approximately 8.8mm
Mounting screws	M2：Depth of 5mm 2 locations on the top and bottom
Tripod mounting screws	Used with the optional tripod plate 1/4-20UNC Depth of 6mm
Power used	Approximately 3.8W
Lens mount	NF mount C mount (Used with the optional NF-C mount convertible adapter. Cannot be used with mounting fittings and the tripod plate) SPM lens (option nac dedicated G resistant lens S2-Cam/P2-Cam)

Attention • The optional NF-C mount convertible adapter is not warrantied for environments with vibration or impact.

Environment

Operating temperature and humidity	0～40℃, 30～80%RH (no condensation) （31～40℃ when using a tripod plate or camera holder mount)
Storage temperature and humidity	-10～60℃, 20～80%RH (no condensation)
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 （RANDOM VIBRATION ENVELOPE） FIGURE514.2-2A
Impact	Half sine, 11msec, 150G, 6 shafts Total of 1,000 times

Main Attachments, Options

Q-Cam Cable (sold separately)

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

Q-Cam Extension Cable (sold separately)

Length	1 m, 3 m, 5 m, 7 m, 10 m	
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

ARMOUT Cable (sold separately)

Length	Approximately 0.5m	
Plug	Q5 side :	JC Micro BIN
	Output side :	BNC plug

LOCAL ETHER Cable (sold separately)

Length	Approximately 0.5m	
Plug	Q5 side :	LEMO FGG.1B.310
	ETHER side :	RJ45 receptacle

Q5 DRP KIT (sold separately)

CD-ROM	HXLink CD-ROM :	Control software HXLink CD-ROM
	Q5 User's Manual :	Camera user's manual electronic version (this document)
	HXLink User's Manual :	HXLink detailed user's manual, electronic version
Brochure	HXLink Quick Start Guide :	HXLink simple user's manual

Control Software HXLink

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

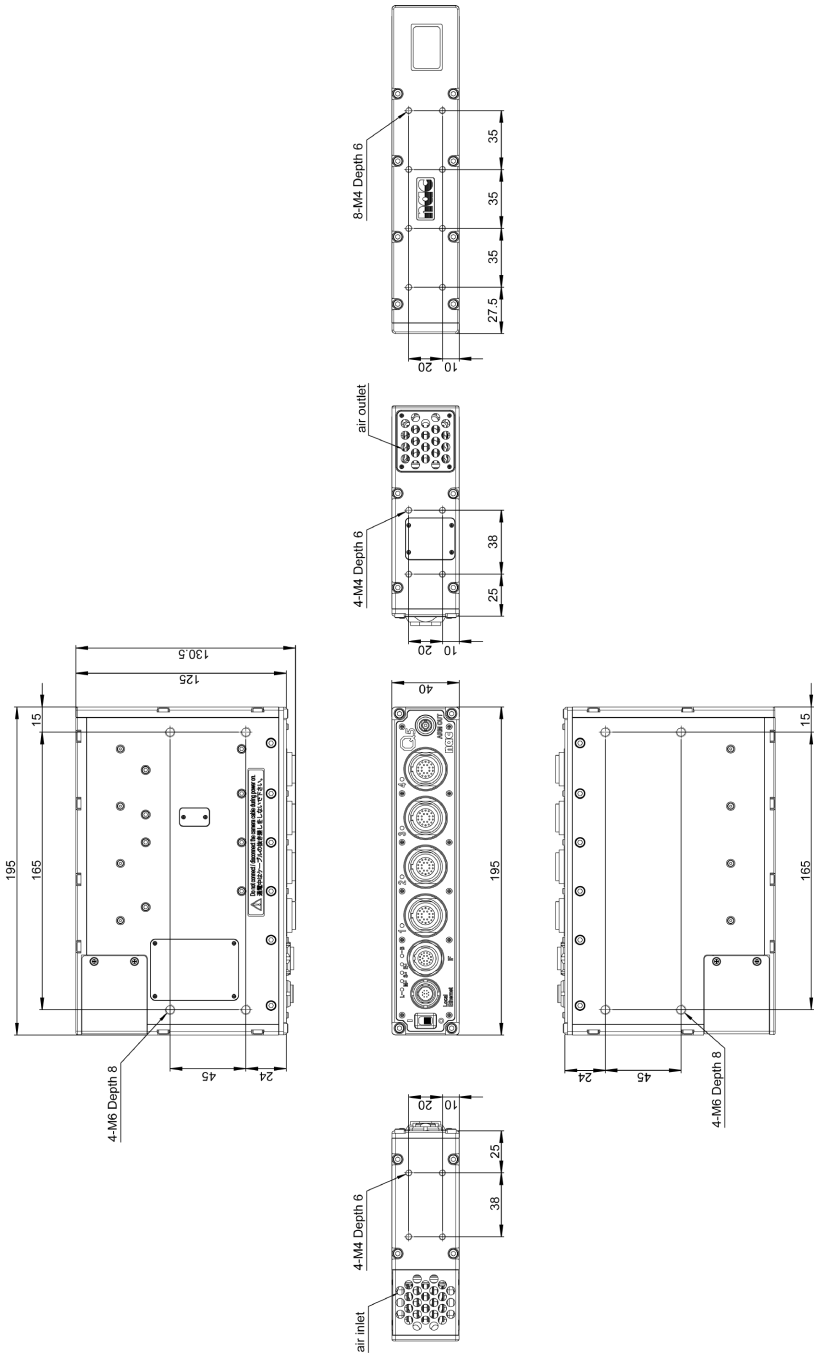
AC Adapter (sold separately)

External dimensions	Approximately W76 × H43.7 × D184 mm (not including connector, cable and such)
Weight	Approximately 1.1 Kg (including AC3 cable)
Operating temperature and humidity	0～60℃, 5～95%RH (no condensation)
Storage temperature and humidity	-40～85℃, 5～95%RH (no condensation)
Connector	Camera side : LEMO FGG.1B.303 AC side : AC3 pin connector
Input	AC100～240V, 47～63Hz
Output	DC24V, maximum 5A
Compatible standards	CE, FCC, PSE, CCC
Colling fan	Yes

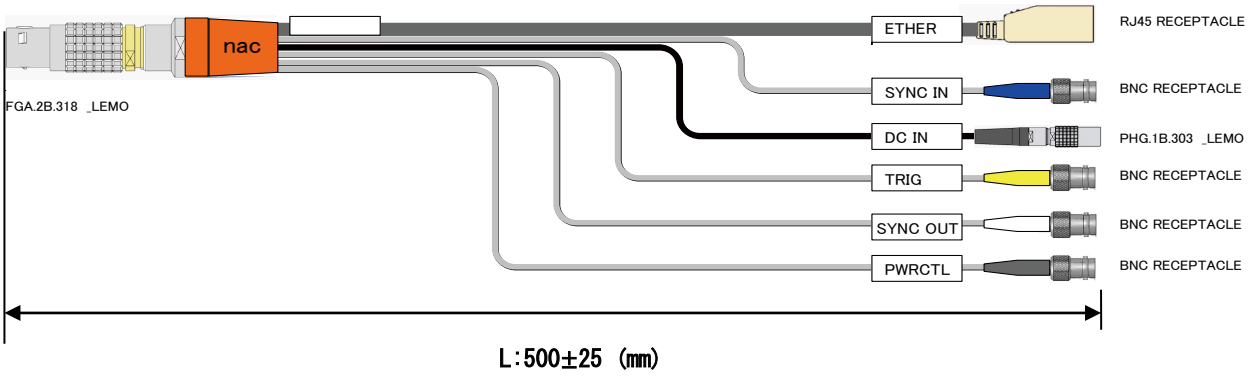
Attention • Make sure the AC3 pin cable is grounded.

Dimensional Drawings

MEMRECAM Q5

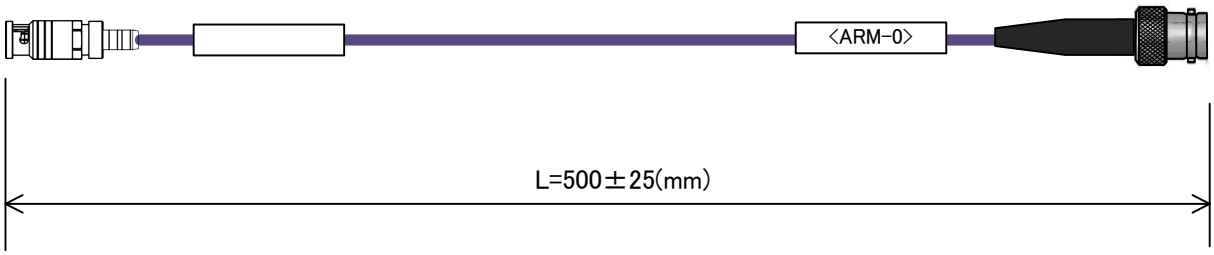


Q-Cam Cable

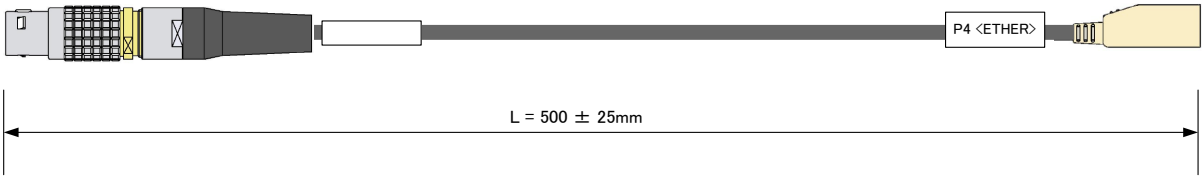


Q-Cam Extension Cable

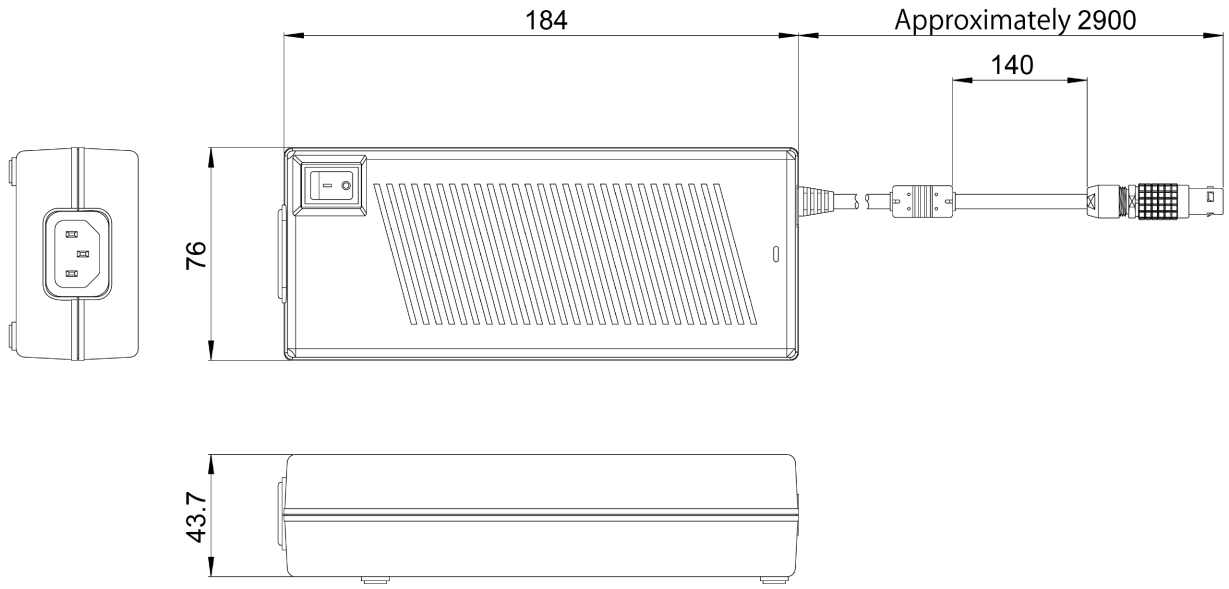
ARMOUT Cable



LOCAL ETHER Cable

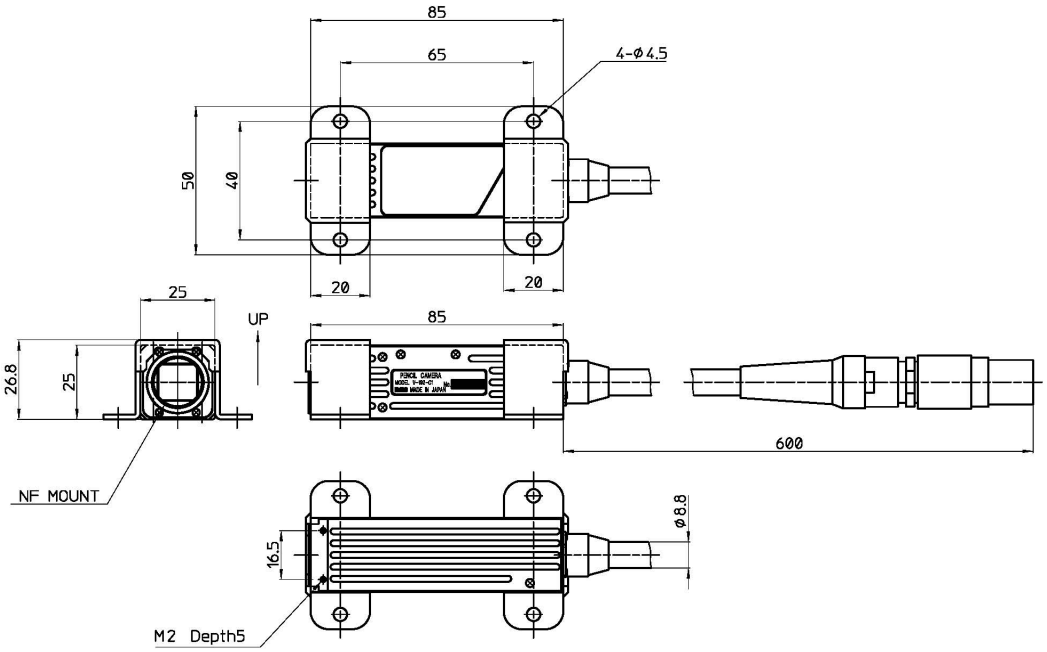


AC Adapter Dimensional Drawing

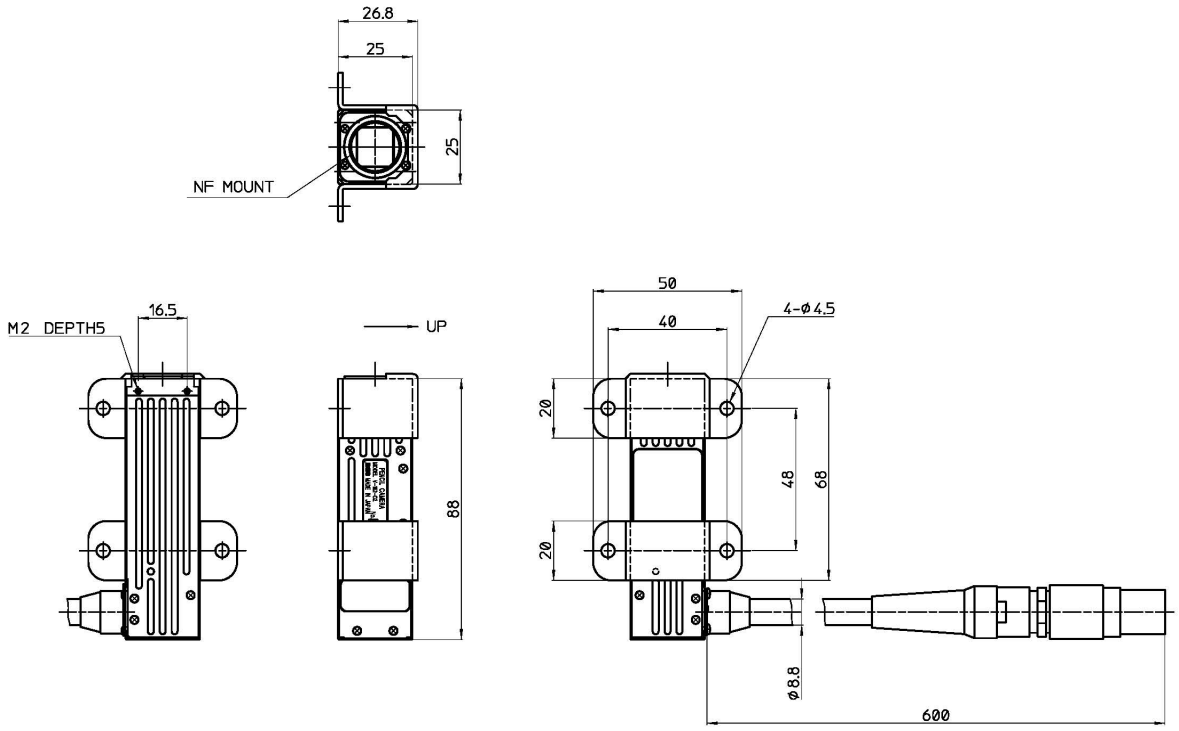


P2-Cam Camera Head

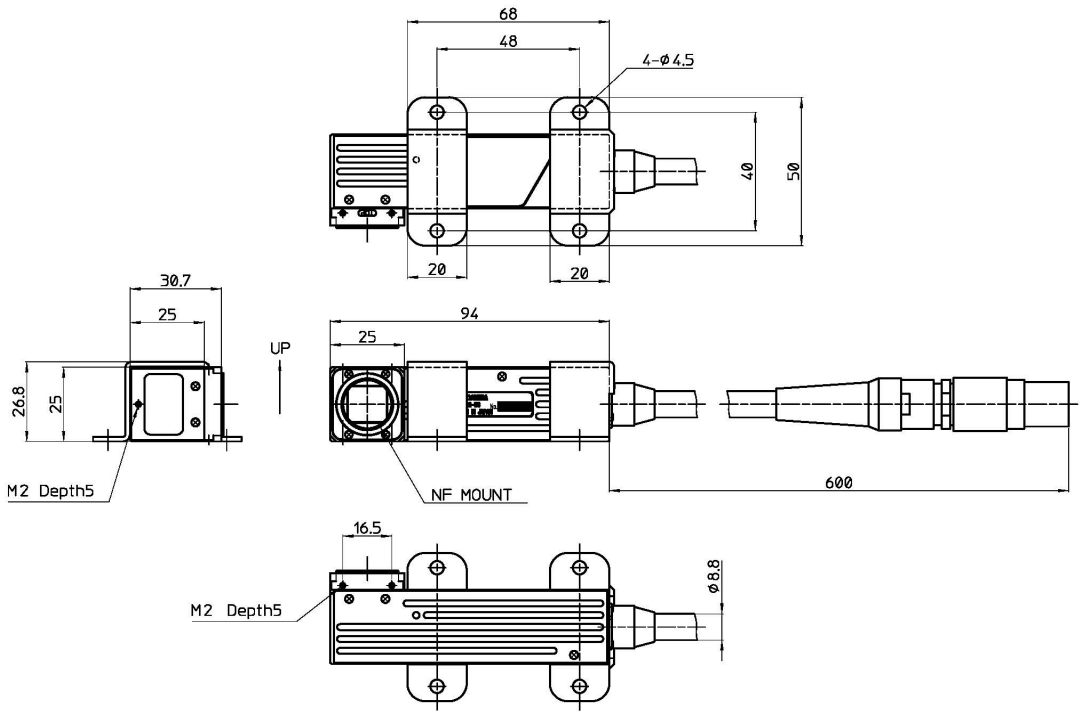
P2-Cam　SS Type (when using mounting fittings)



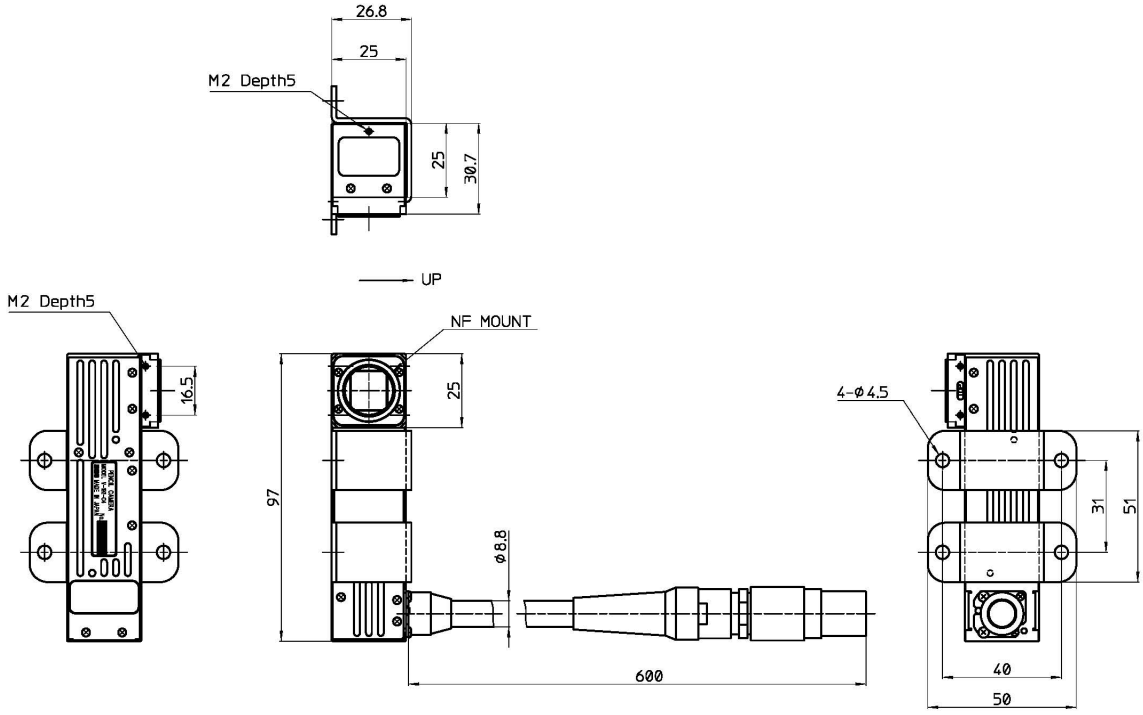
P2-Cam SA Type (when using mounting fittings)



P2-Cam　AS Type (when using mounting fittings)

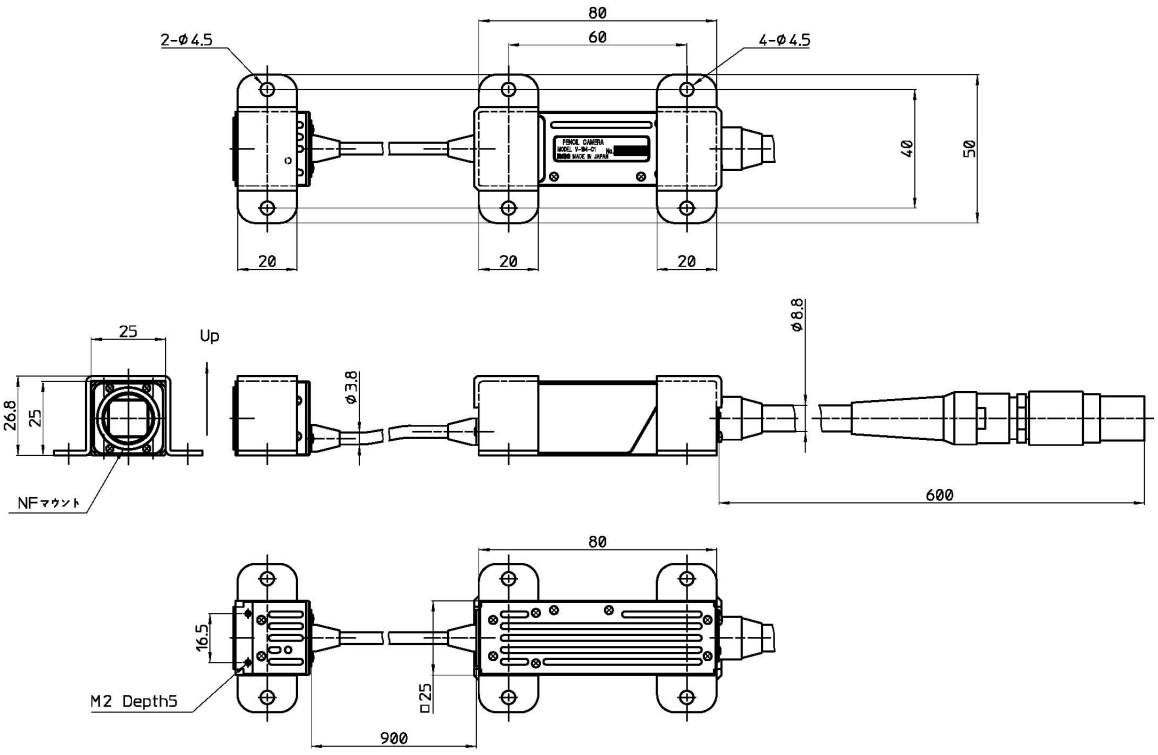


P2-Cam　AA Type (when using mounting fittings)

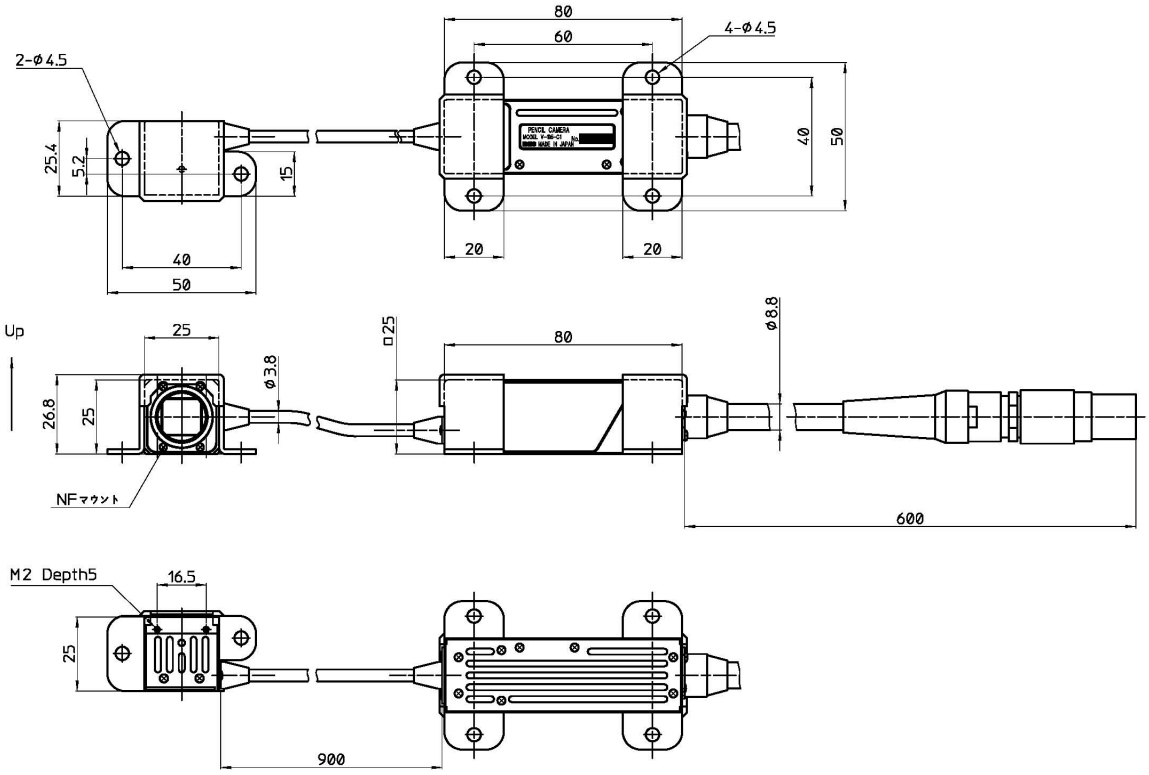


S2-Cam Camera Head

S2-Cam　Straight Type (when using mounting fittings)

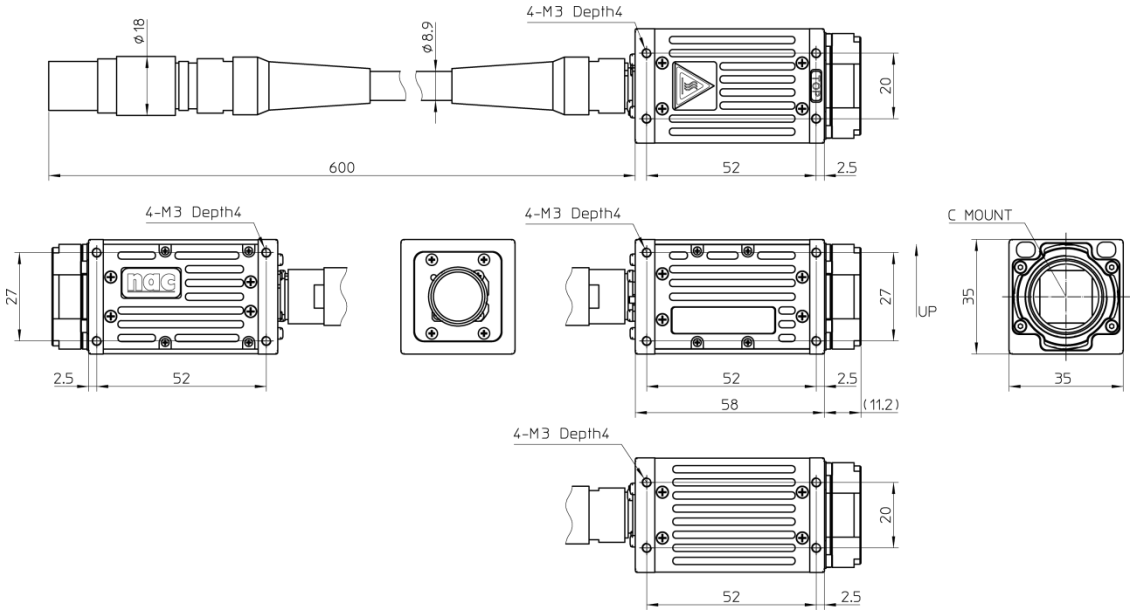


S2-Cam　Side Type (when using mounting fittings)

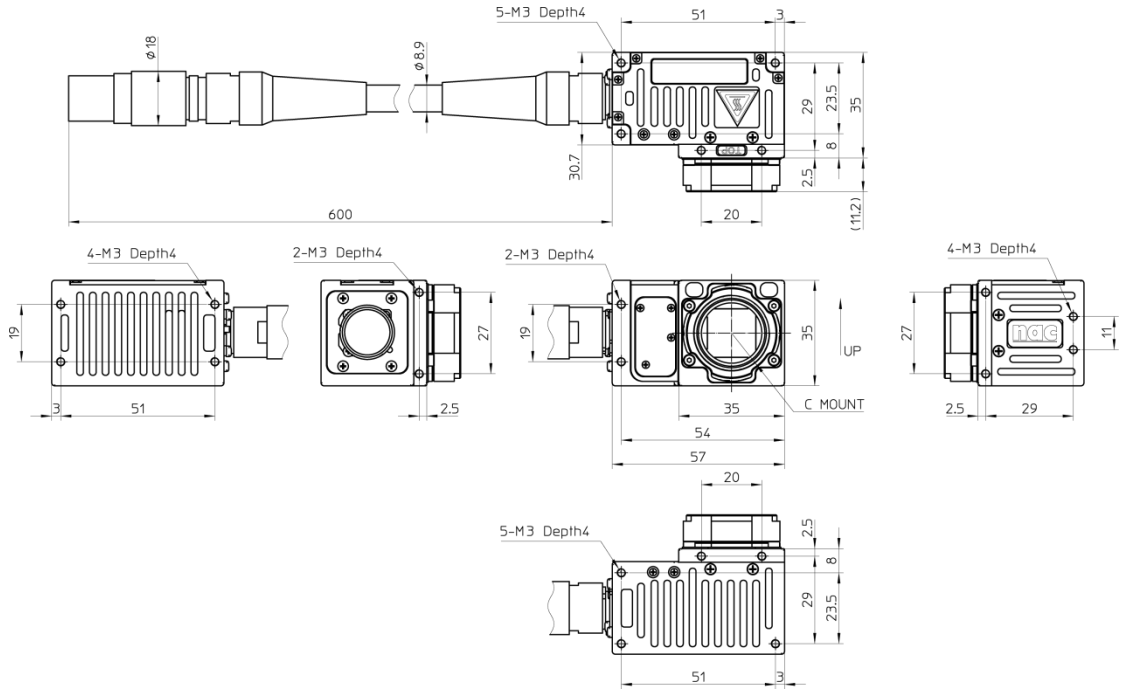


C-Cam Camera Head

C-Cam　Straight Type

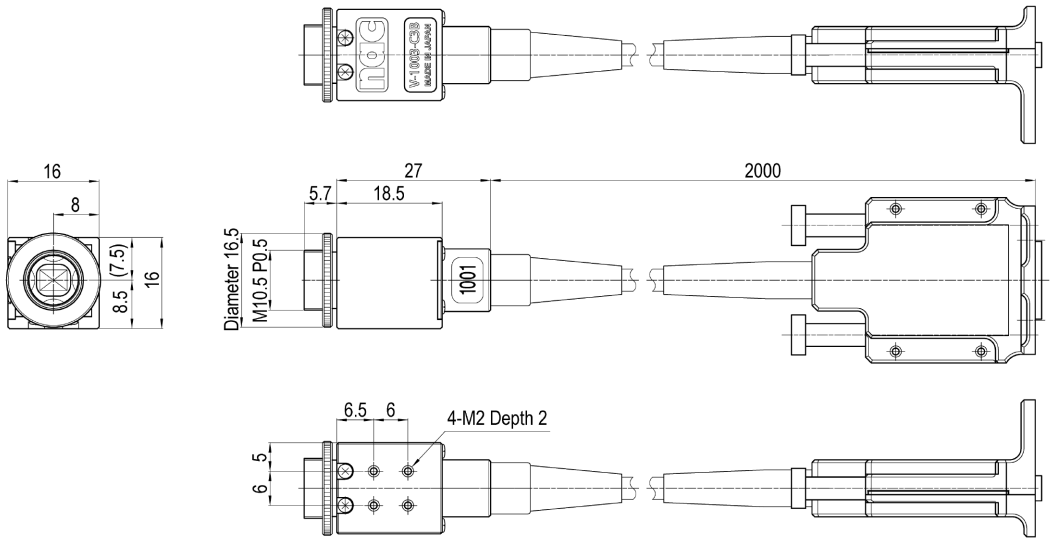


C-Cam Side Type

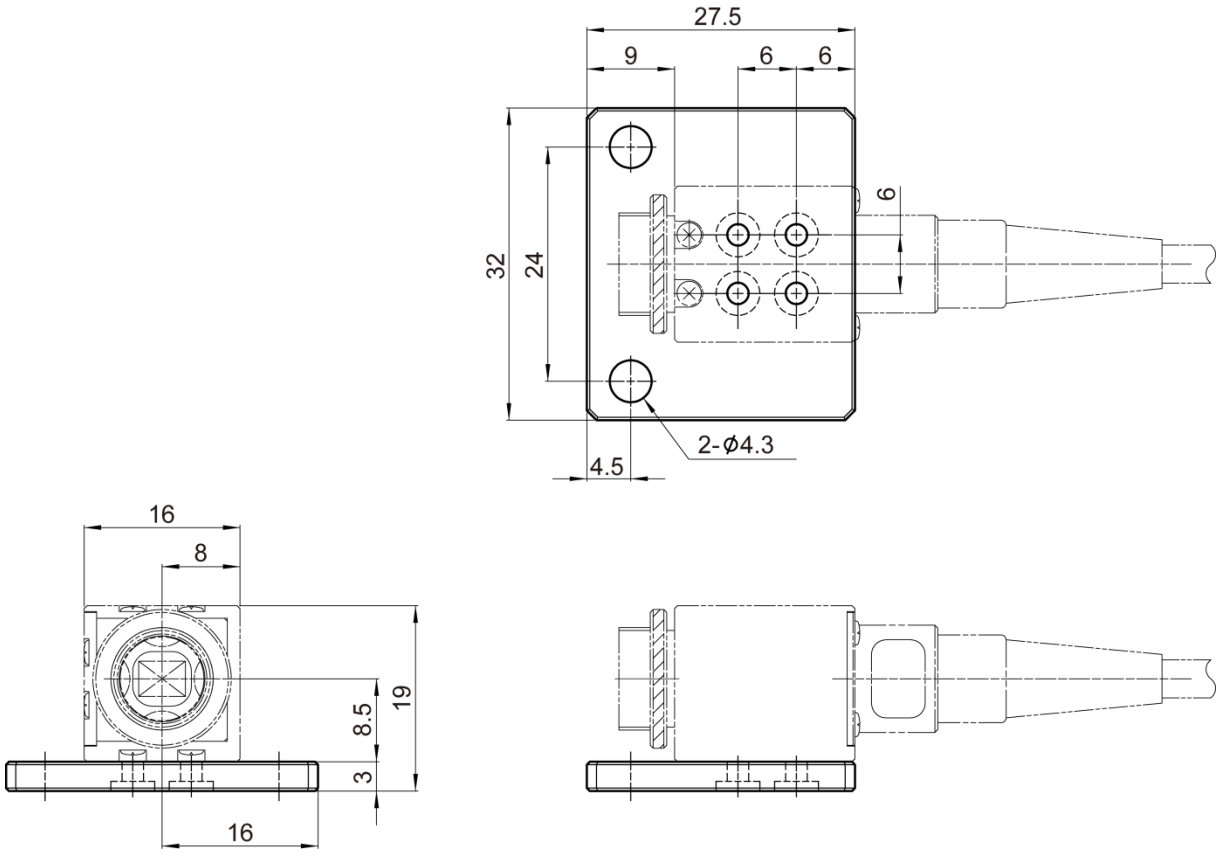


µ-Cam Camera Head

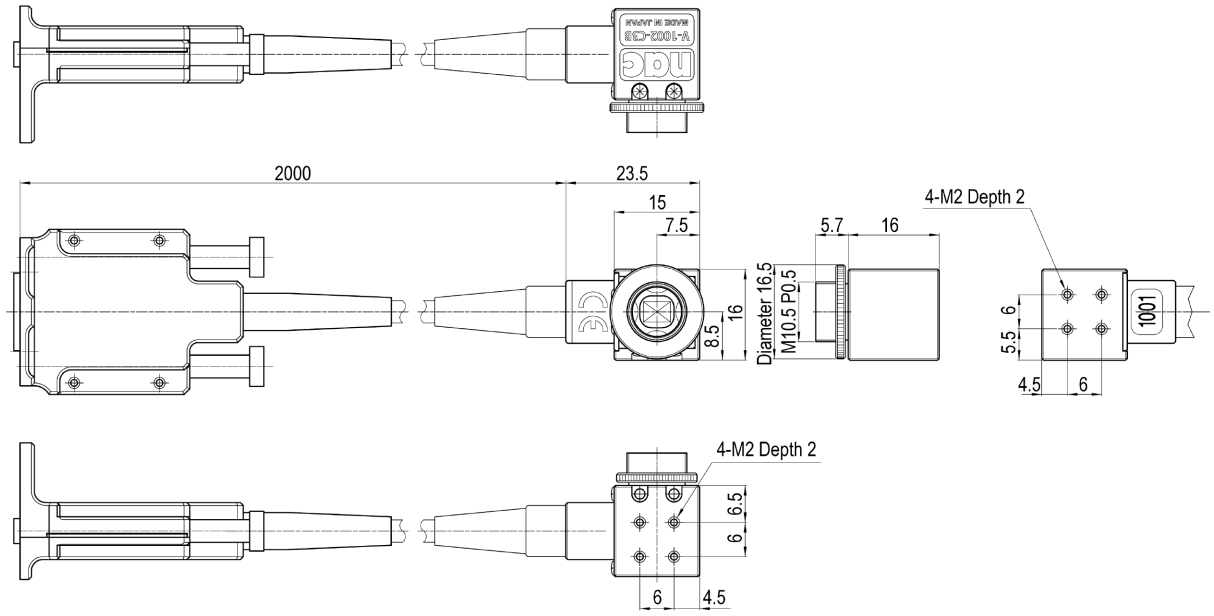
µ-Cam Camera Head Straight Type



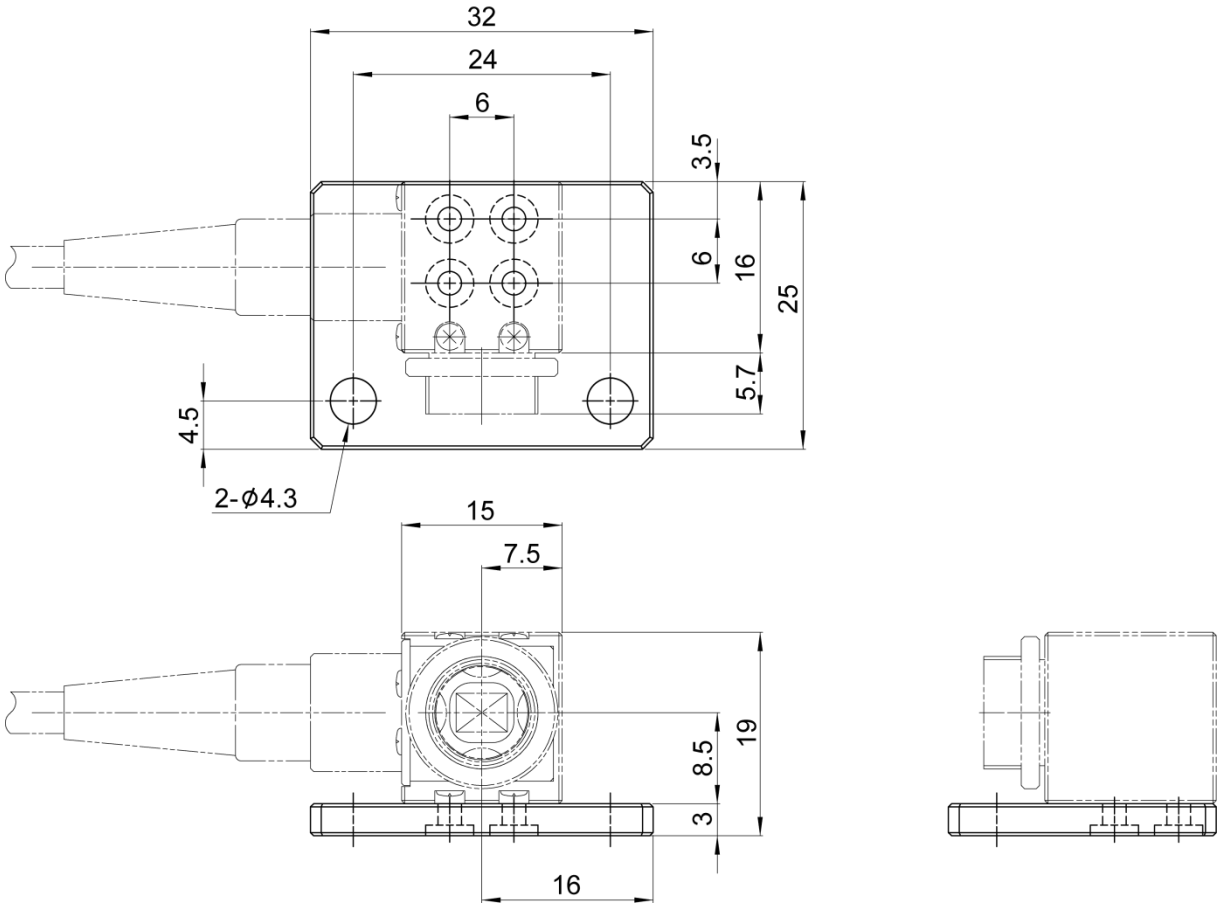
■μ-Cam Camera Head Mounting Plate (Straight, Camera Head Attachment)



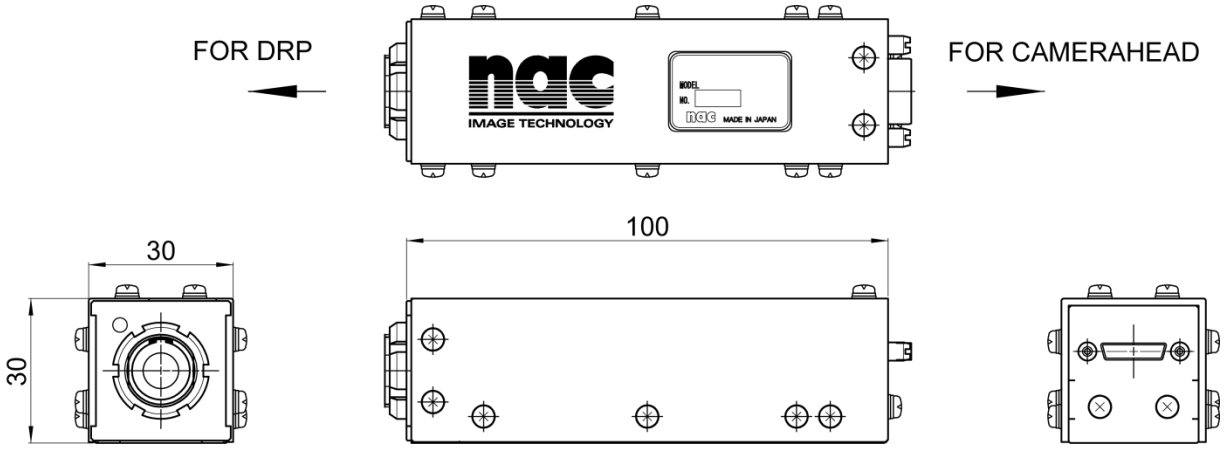
μ-Cam Camera Head Side Type



μ-Cam Camera Head Mounting Plate (Side, Camera Head Attachment)



μ-Cam RELAY BOX



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5

Options

(00419)D

Options

High-speed photography under various environment is possible by attaching an option to a camera head.

BB1 UNIT

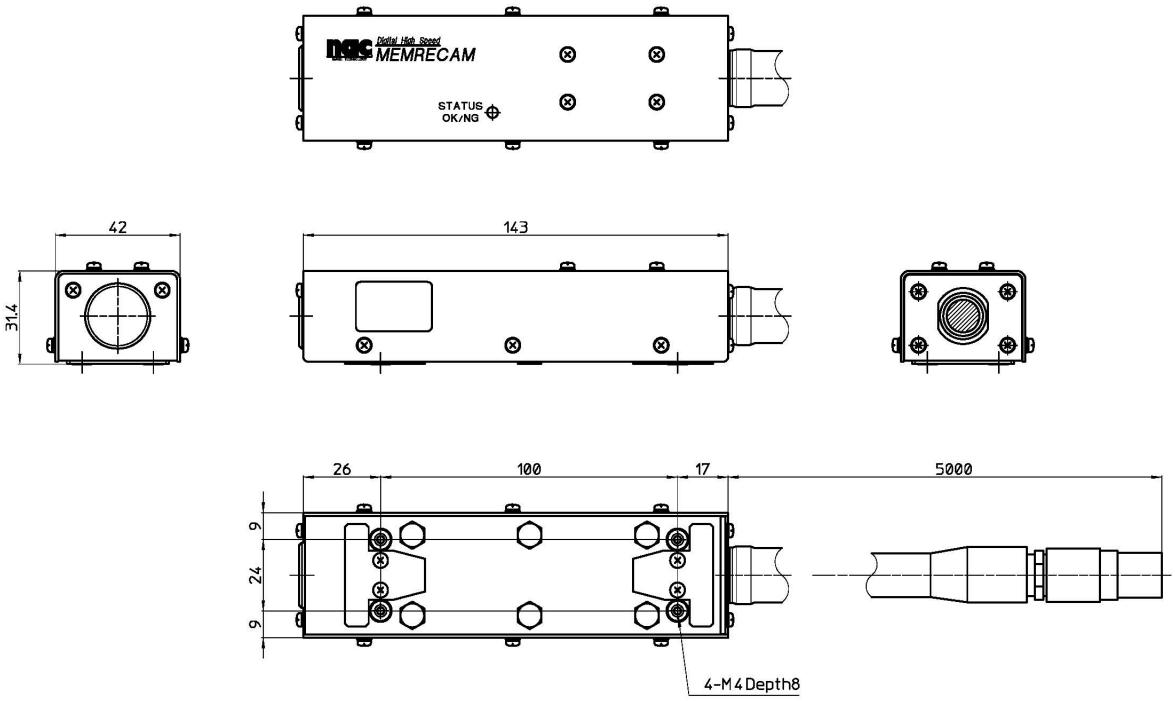
BB1 UNIT

Extension unit for 4 types of camera heads

Attention • The BB1 UNIT cannot be used when the Q5 is connected to the Q-HUB.

External Dimensions (W×H×D)	Approximately W42 × H31.4 × D143mm (excluding the connector and protruding parts; cables not included)
Weight of the main unit	Approximately 1.8kg (including cables) Approximately 0.2kg (not including cables)
Status display on the LED	Green : Normal Red : Abnormal communication with DRP Orange : Abnormal communication with camera Not lit : No power
Mounting screws	4 locations on the top and bottom M6 Depth of 6mm 4 locations on the side, 8 locations on the back M4 Depth of 6mm
Operating temperature and humidity	0～40℃、30～80%RH (no condensation)
Storage temperature and humidity	-10～60℃、20～80%RH (no condensation)
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE 514.2-2A
Impact	Half sine, 11msec, 150G (but only 100G in the direction the connector is removed)
Power consumed	Approximately 2W (supplied from the Q5)
Connector	Plug : LEMO FGG.3B.326 equivalent product (pigtail) or ODU SX3L0C-P26PFG0-0001 (pigtail) Receptacle : LEMO EGG.3B.326 or ODU G13L0C-P26LFG0-0000
Cable	Pigtail configuration : Length of approximately 5 m Diameter Approximately 12.9mm
Safety Standards	EN60950
Electromagnetic Compatibility	EN55022、EN55024、FCC Part 15 Class A

External Figure

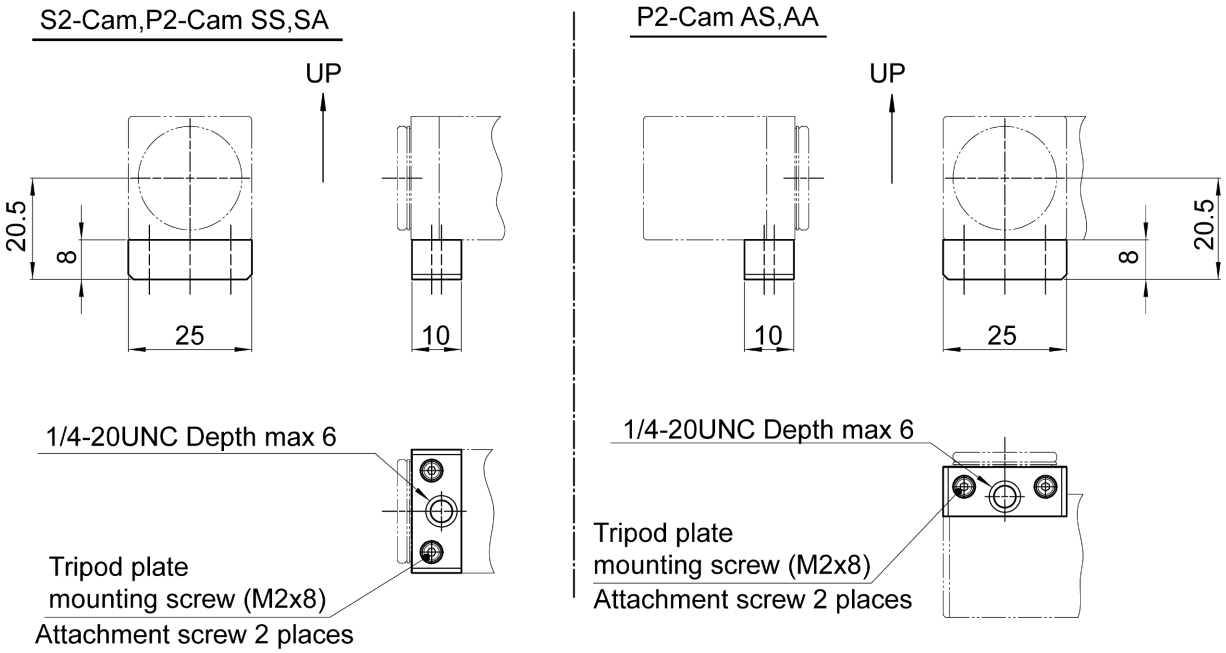


P2-Cam/S2-Cam Options

Tripod plate (Both P2-Cam/S2-Cam)

External dimensions (W×H×D)	Approximately W195 × H40 × D125mm (Excluding connectors and protruding parts)
Mounting screws	1/4-20UNC (small screw) Depth of 6mm
Camera head mounting screws	M2×8 2 (attached)

External figure

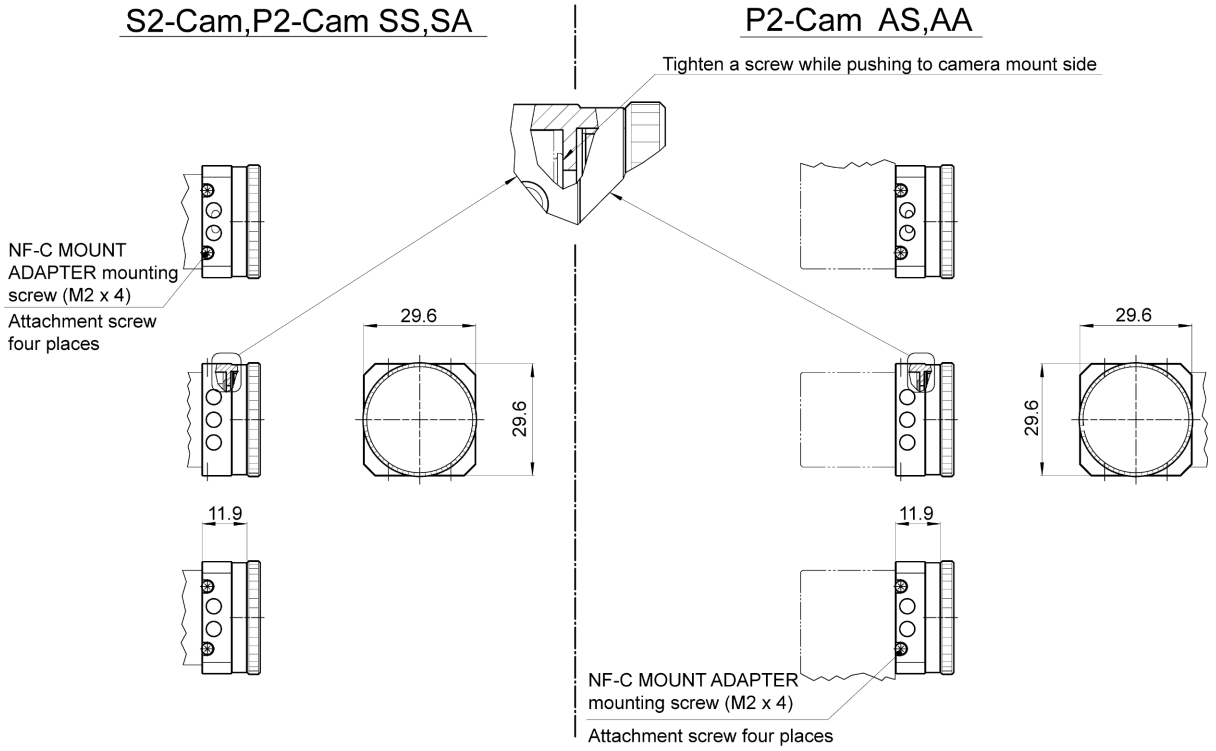


Attention • The tripod plate cannot be used in the mounted state in environments with impact or vibration.

C Mount Adapter (Both P2-Cam/S2-Cam)

External dimensions (W×H×D)	Approximately W29.6×H29.6×D11.9 mm
Mounting screws	M2 x 4 4 (attached)

External figure

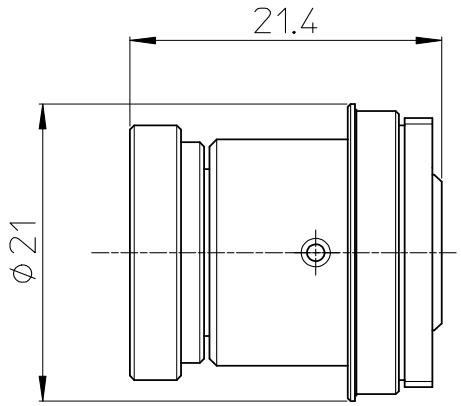


Attention • The C mount adapter cannot be used in the mounted state in environments with impact or vibration.

G-resistant Lens f=4.2mm (SPM lens, for P2-Cam/S2-Cam)

Focal distance	4.16 mm
F stop	F2.8 (fixed)
Film coverage	0.3 m ～ ∞ (Pan focus) 0.1 m (Shortest filming distance with lens feeding)
Image size	½ type
Angle of view	90° (horizontal) / 66.9° (vertical) / 114° (diagonal)
Distortion (Maximum value)	-23 % (barrel type)
Lens configuration	6 - 6
External dimensions (main unit lens)	Φ21x21.4mm (Total length of 15.5mm from front of camera to tip of lens)
Weight	Approximately 12 g
Mount	P2-Cam, S2-Cam dedicated mount
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE 514.2-2A
Impact	Half sine, 11msec, 150G

External figure

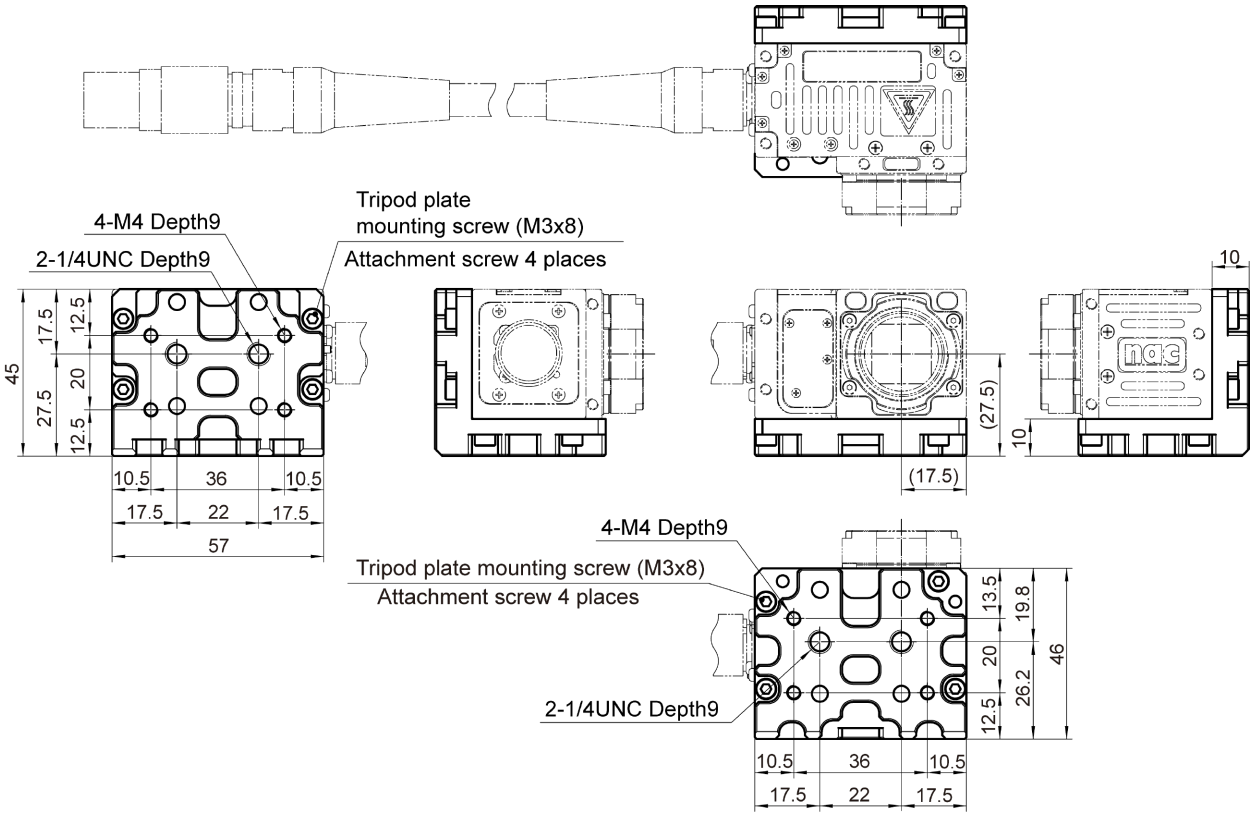


C-Cam Options

Tripod plate (Side)

External dimensions (W×H×D)	Approximately W57×H45×D46 mm
Mounting screws	1/4-20UNC (small screws) 2 locations Depth of 9mm
Service holes	M4 4 locations Depth of 9mm
Camera head mounting screws	M3×8 4 (attached)

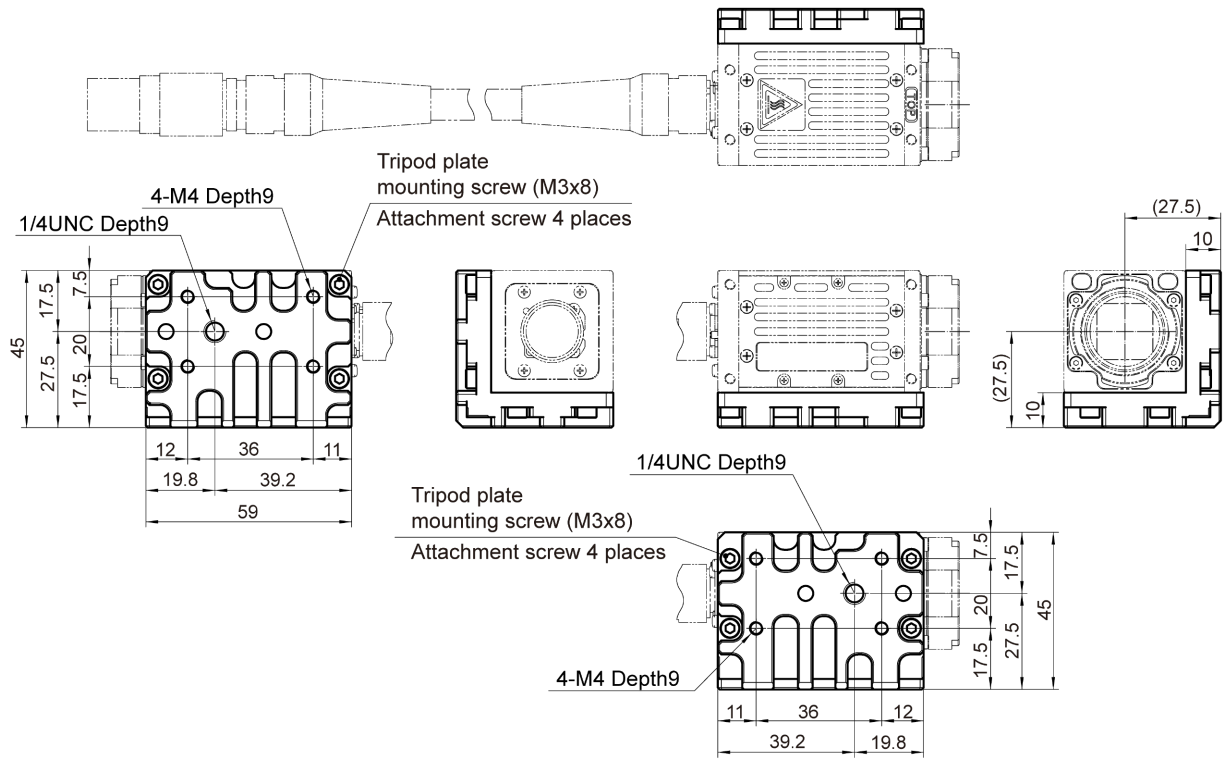
External figure



Tripod plate (Straight)

External dimensions (W×H×D)	Approximately W45×H45×D59 mm
Mounting screws	1/4-20UNC (Small screws) 2 Depth of 9mm
Service holes	M4 4 locations Depth of 9mm
Camera head mounting screws	M3×8 4 (attached)

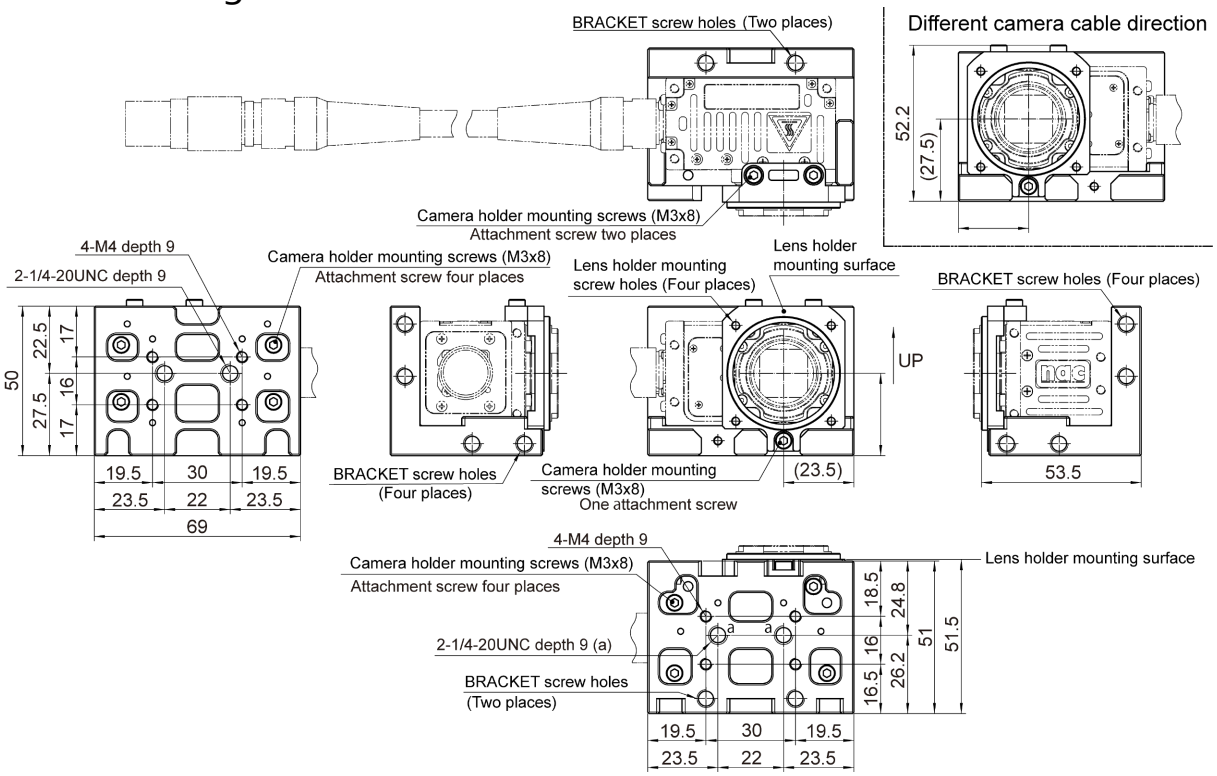
External figure



C-Cam G-resistant Camera Holder (Side)

External dimensions (W×H×D)	Approximately W69×H53×D53.5mm
Mounting screws	1/4-20UNC (Small screws) 2 locations Depth of 9mm
Service holes	M4 4 locations Depth of 9mm
Camera head mounting screws	M3×8 4 (attached)

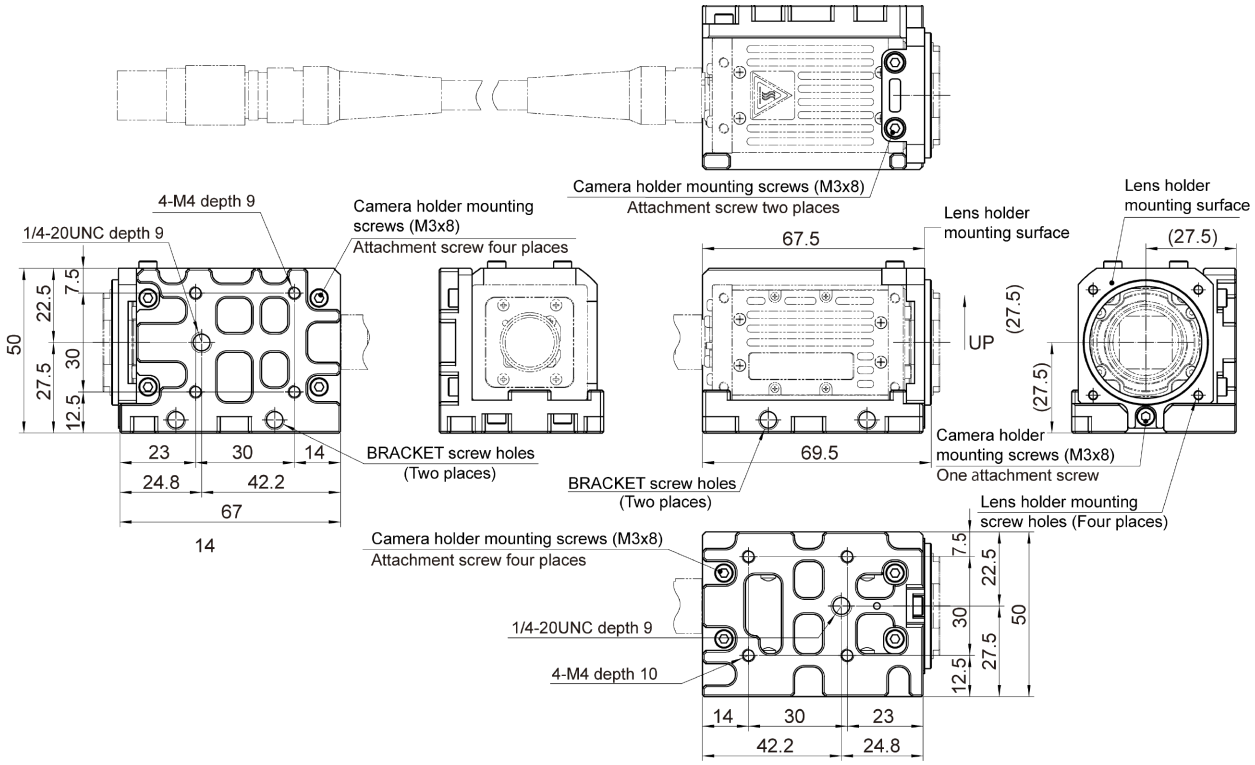
External figure



C-Cam G-resistant Camera Holder (Straight)

External dimensions (W×H×D)	Approximately W50×H53×D69.5 mm
Mounting screws	1/4-20UNC (Small screws) 2 locations Depth of 9mm
Service holes	M4 4 locations Depth of 9mm
Camera head mounting screws	M3×8 4 (attached)

External figure

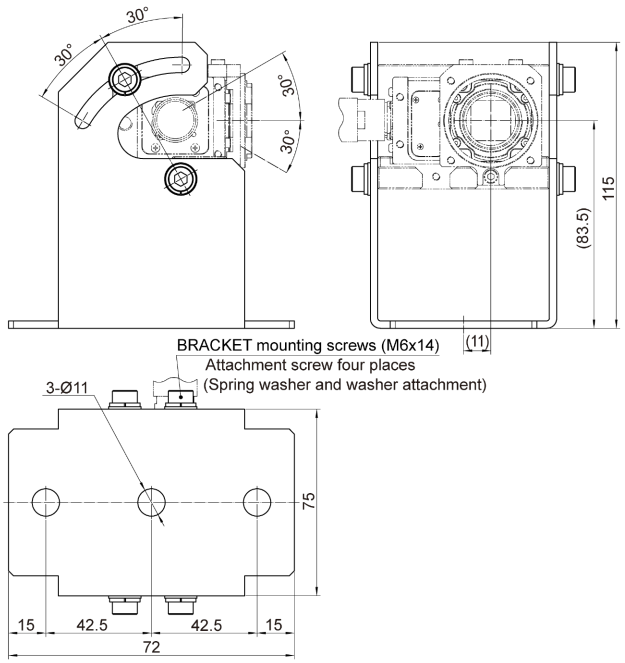


■Bracket for C-Cam G-resistant Camera Holder　(Angle Adjustment Fitting・Side)

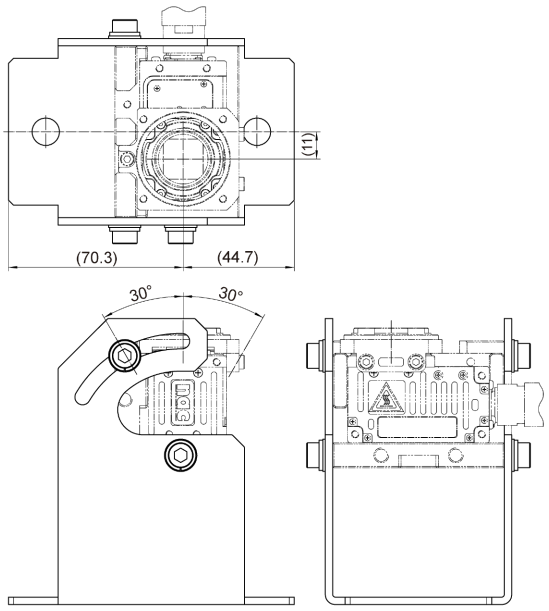
External dimensions　(W×H×D)	Approximately　W75×H115×D115 mm
Mounting screws	M6×14 Hexagonal hole with cap bolt 4　(M6 washer, spring washer)
Service holes	M4 4 locations Depth of 9mm
Camera holder mounting screws	M10 diameter 11mm 3 locations

External figure

Camera mounting method 1



Camera mounting method 2

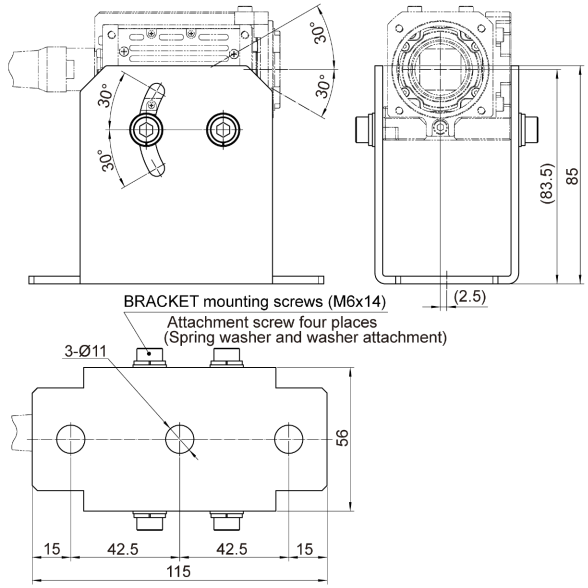


■Bracket for C-Cam G-resistant Camera Holder (Angle Adjustment Fitting・Straight. Side also Available.)

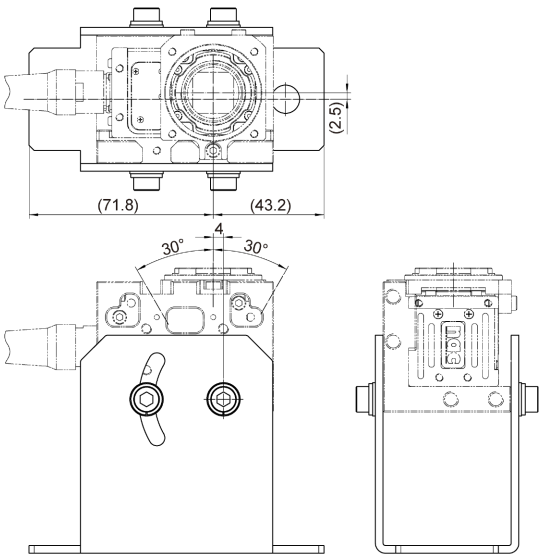
External dimensions (W×H×D)	Approximately W56×H85×D115 mm
Mounting screws	M6×14 Hexagonal hole with cap bolt 4 (M6 washer, spring washer)
Service holes	M4 4 locations Depth of 9mm
Camera holder mounting screws	M10 diameter 11mm 3 locations

External figure

Camera mounting method 1
(C-Cam Straight)



Camera mounting method 2
(C-Cam Side)



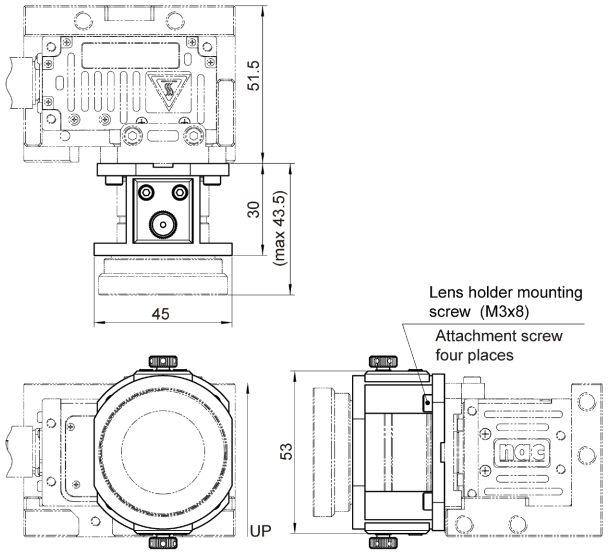
Option

C-Cam Lens Holder (Both Straight / Side)

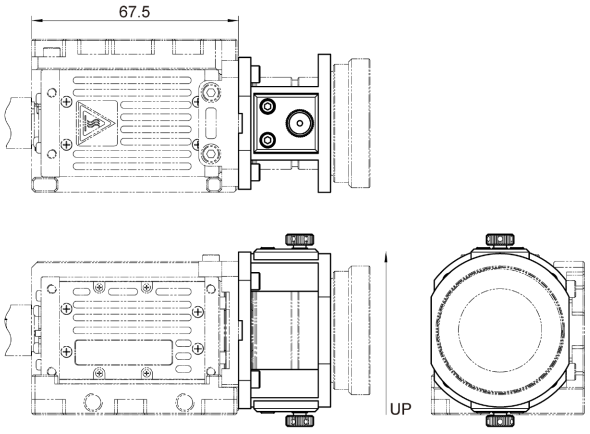
External dimensions (W×H×D)	Approximately W45×H68.6 (Max) × D30 mm (H varies according to the lens used)	
Mounting screws	M6×14 Hexagonal hole with cap bolt 4 (M6 washer, spring washer)	
Camera head mounting screws	M3×8 4 (attached)	
Service holes	M4 4 locations Depth of 9mm	
Lens	Produced by KOWA	LM3NC1M (f=3.5mm)
		LM5JC1M (f=5mm)
	Produced by RICOH	FL-CC0814-2M (f=8mm)

External figure

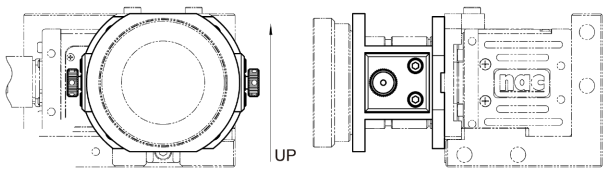
C-Cam Side figure of mounting 1



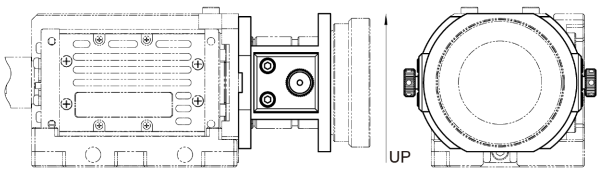
C-Cam Straight figure of mounting 1



C-Cam Side figure of mounting 2



C-Cam Straight figure of mounting 2

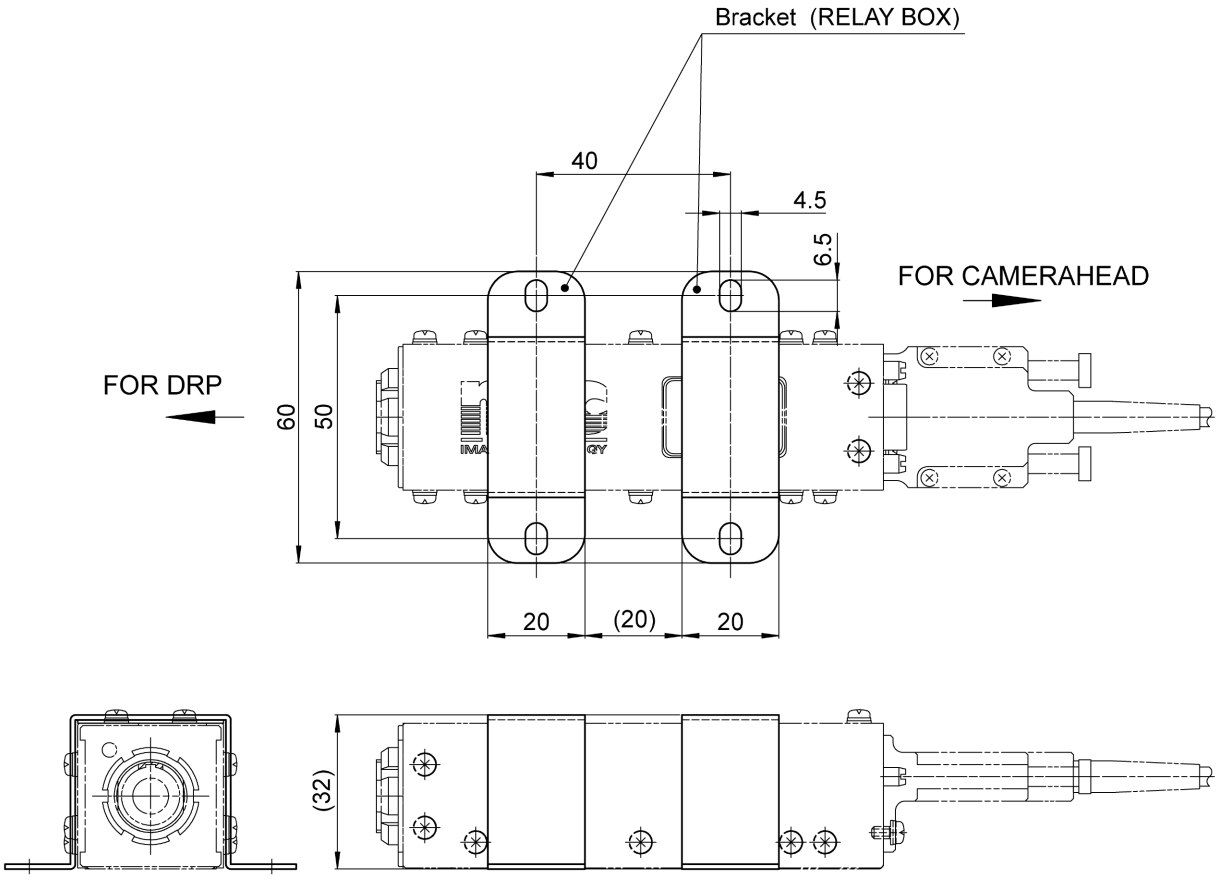


μ-Cam Options

μ-Cam RELAY BOX Fixed Fitting

External dimensions (W×H×D)	Approximately W60×H20×D32 mm

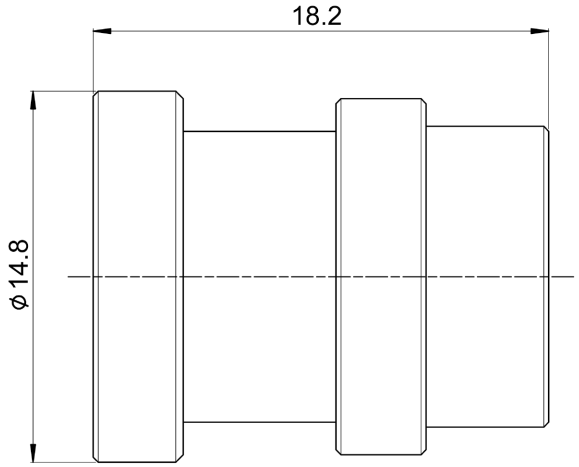
External figure



G-resistant Lens f=3mm (MCM lens, for µ-Cam)

Focal distance	3.13 mm
F stop	F2 (fixed)
Film coverage	0.1 m ～ ∞
Image size	1/3 type
Angle of view	92° (horizontal) / 67.6° (vertical) / 119.1° (diagonal)
Distortion (Maximum value)	-43.5 % (barrel type)
Lens configuration	7 - 7
External dimensions (main unit lens)	Φ14.8x18.2mm
Weight	Approximately 6 g
Mount	M10.5 P0.5
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE) FIGURE 514.2-2A
Impact	Half sine, 11msec, 150G

External figure



6

Q-HUB

(00419)D

Q-HUB Features

MEMRECAM Q5 and Q-HUB are to put it together, and high-speed recording under various environment is possible.

Film with a Maximum of 2 Q5 on 1 Q-HUB

With one Q-HUB, you can connect a maximum of 2 MEMRECAM Q5s, with a total of 8 camera heads. It is possible to supply the power and control the Q5.

Cascade Connection

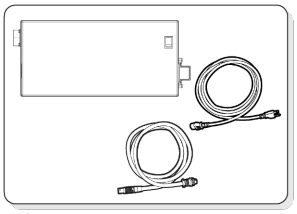
Cascade connections are available. Please target about 3 levels. (⏭🕮 6-16)

The Ability to Construct a Multi-Camera System with our Existing Cameras

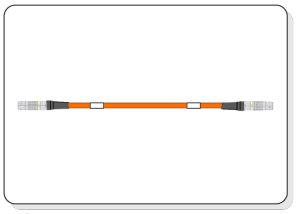
You can construct a system of multiple cameras by using the GX-HUB with the MEMRECAM Q1 series, GX series and HX series cameras.

Main Options

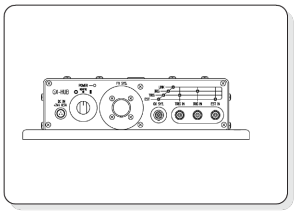
The main other For Sale (option) of Q-HUB includes the following.



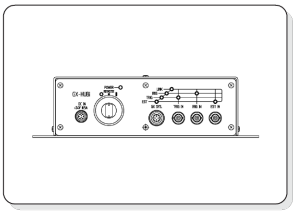
● AC POWER SYSTEM



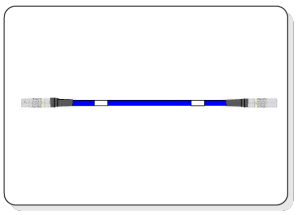
● Q-Cam remote cable



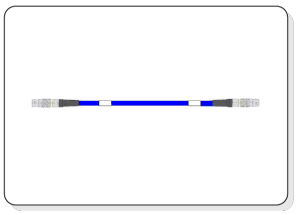
● GX-HUB



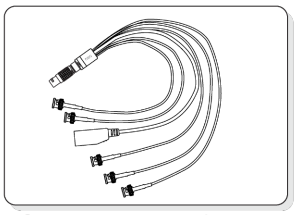
● GX-HUBi



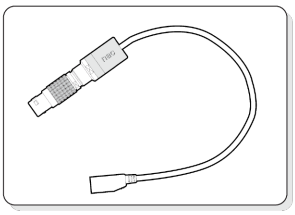
● GX remote cable



● GX remote cable
(for GX-HUBi)



● J3 branch cable



● Simple J3 cable

- AC POWER SYSTEM — AC POWER SYSTEM for the Q-HUB. Set of an AC cable and a DC cable
- Q-Cam remote cable : Q5/Q1m/Q1v and Q-HUB connection cable
- GX-HUB — MEMRECAM GX, HX SERIES multi-camera option (environmentally resistant properties)
- GX-HUBi — GX SERIES, HX SERIES multi-camera option (no environmentally resistant properties)
- GX remote cable — Q-HUB and GX-HUB connection cable
- GX remote cable (for GX-HUBi) — Q-HUB and GX-HUBi, Q-HUB and MEMRECAM GX, HX camera connection cable
- J3 branch cable — HX, GX SERIES input/output cable
  BNC connector includes a plug type and a receptacle type
- Simple J3 cable — Joint HX, GX SERIES control PC connection cable

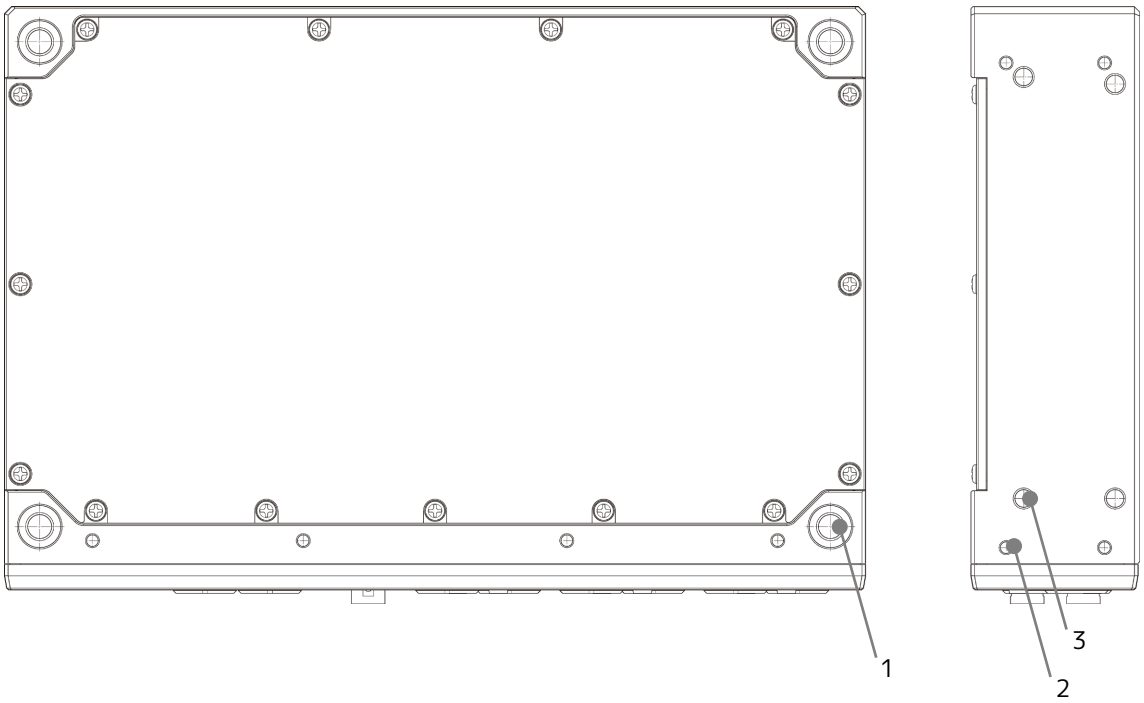
Attention

- Do not use the AC POWER SYSTEM in environments with impact or vibration.
- The Q-Cam remote cable cannot be used with the MEMRECAM HX series or the GX series.
- If using the GX-HUB/GX-HUBi, a separate dedicated AC POWER SYSTEM is required.
- Do not use the GX-HUBi in environments with impact or vibration. Use the GX-HUB in those environments.
- Read the separate page regarding the Q-HUB BATTERY PACK (▶▶🕮 7-2).

External Appearance and Names for Each Part

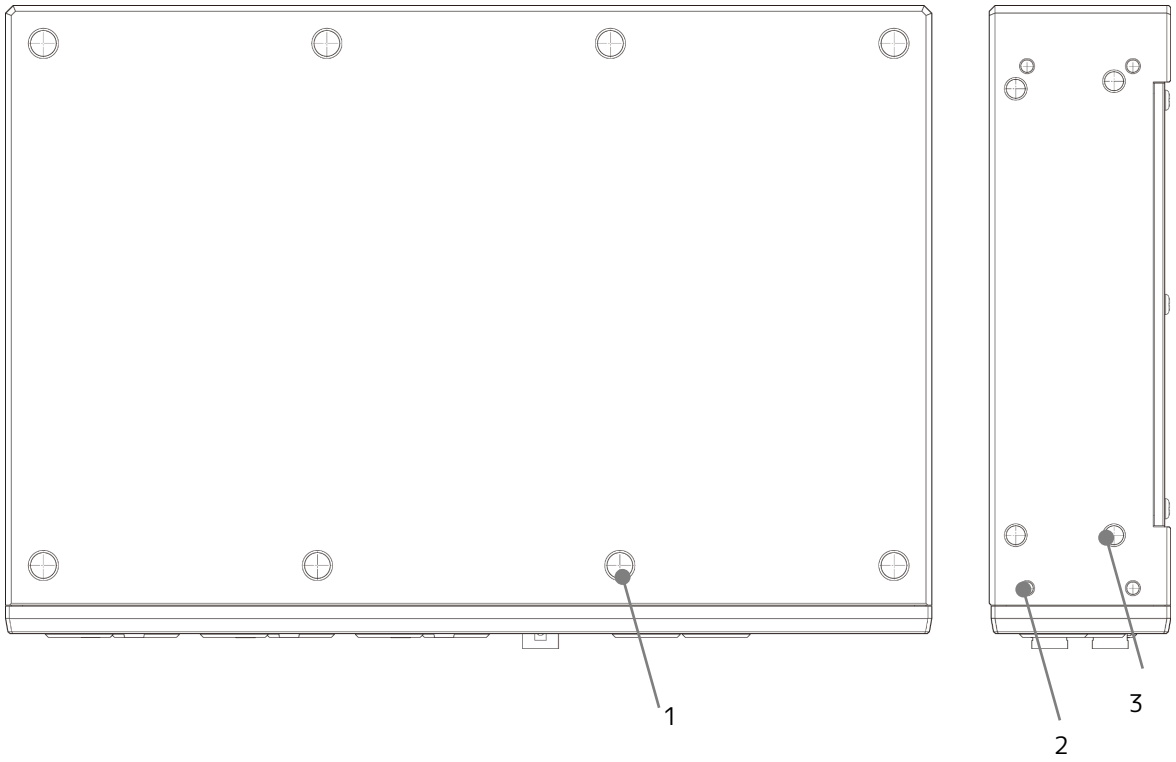
External Appearance and Names for Each Part

Top and Right Side



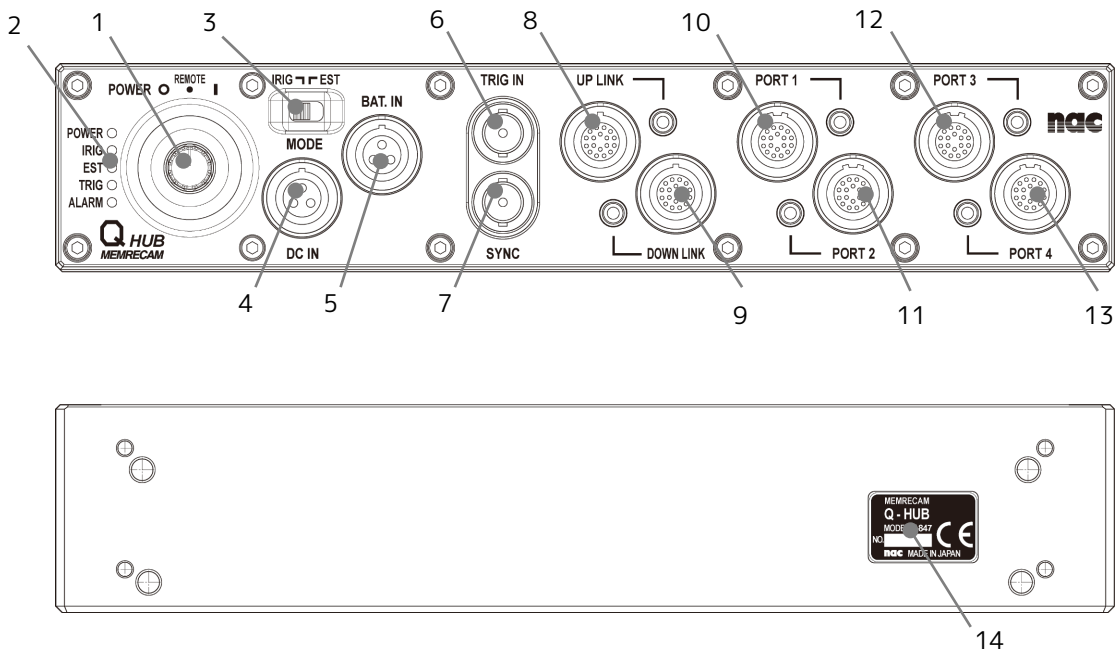
1 Screw opening (M8 4 locations)
2 Screw opening (M4 4 locations)
3 Screw opening (M6 4 locations)

Left Side, Bottom



1 Screw opening (M8 8 locations)
2 Screw opening (M4 4 locations)
3 Screw opening (M6 4 locations)

Front, Back



15 Power switch
16 Status LED
17 Sync signal switch (Factory setting: IRIG)
18 DC IN connector
19 BAT. IN connector
20 TRIG IN connector
21 SYNC connector
22 UP LINK connector
23 DOWN LINK connector
24 PORT 1 connector
25 PORT 2 connector
26 PORT 3 connector
27 PORT 4 connector
28 Product name plate (with product number)

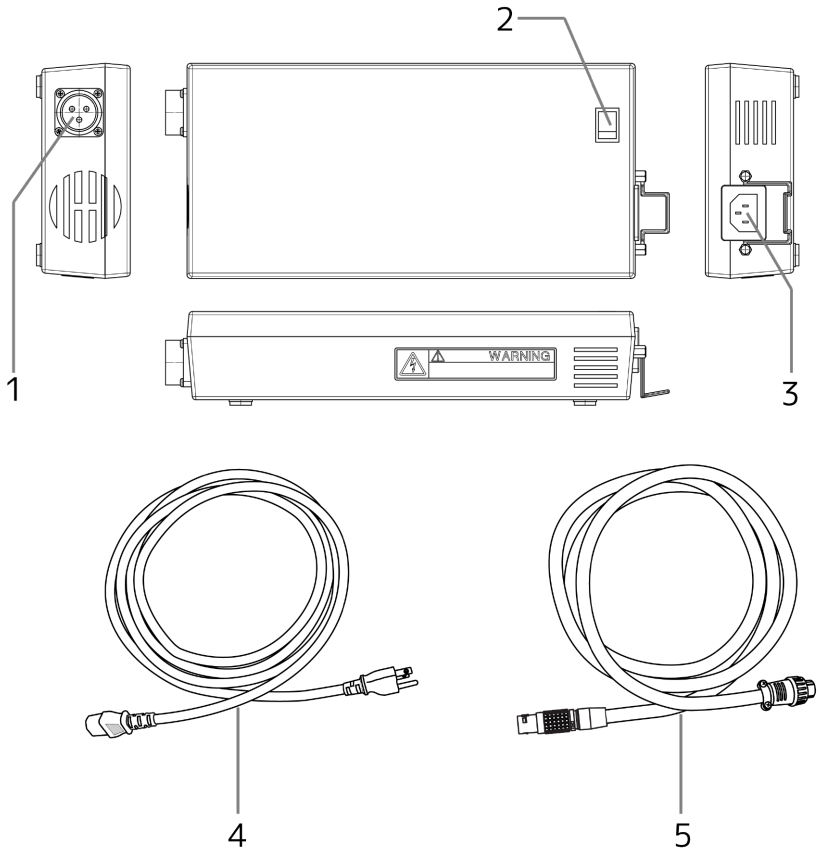
Status LED

The 5 status LED show the status of the Q-HUB.

POWER ○
IRIG ○
EST ○
TRIG ○
ALARM ○

LED	LED Status	Operation	⏭🕮
POWER	Green	Power ON	6-14
	Not lit	Power OFF	6-15
IRIG	Green	IRIG signal or 1kHz input, and locked. (Sync signal switch set at IRIG)	
	Red	No IRIG signal or 1kHz input, and not locked, even with input. (Sync signal switch set at IRIG)	
	Not lit	Sync signal switch set at EST	
EST	Green	Sync signal switch set at EST	
	Not lit	Sync signal switch set at IRIG	
TRIG	Green	For 1 second after trigger signal input (then not lit)	
		When there is trigger signal input for less than 1 second	
	Not lit	No trigger signal	
ALARM	Red	When there is an overcurrent, overvoltage, or low voltage detected in the power line	
	Not lit	Normal	

External Appearance and Names for Each Part of the AC Power System



1 DC connector ⏭🕮 6-11
2 Power switch ⏭🕮 6-14
3 AC connector ⏭🕮 6-11
4 AC cable ⏭🕮 6-11
5 DC cable ⏭🕮 6-11

Connect the Equipment and Cables

This describes the connections for peripherals for Q-HUB such as the power as well as the cables.

Input/Output Connector

List of Input/Output Connectors

Connector Name	Branch Connector Name	Input/Output Signal
PORT 1～4	—	For Q5/Q1m/Q1v connection (※1)、(※2)
UP LINK	—	Q-HUB、GX-HUBi connection (※3) GX-HUB connection (※4) Connnection for Windows PC control (※5,6)
	ETHER (※5 or 6)	1000BASE-T Ethernet
	TRIG2 (※6)	External trigger input (TRIG2)
	EST2 (※6)	IRIG-B (DCLS) , SYNC 1kHz, recording start signal input (EST2)
	IRIG-B (※6)	IRIG-B (AM), time code input
	EPO (※6)	Exposure pulse output (EPO)
	PWRCNT (※6)	Power control signal input
DOWN LINK	—	For Q-HUB, MEMRECAM GX camera, HX camera connection (※3)
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 Q-Cam remote cable (option) required.

※2 When connecting the Q5, one can be connected to the PORT1~2 or PORT3～4. (maximum total of 2).

※3 GX remote cable (GX-HUBi option) required.

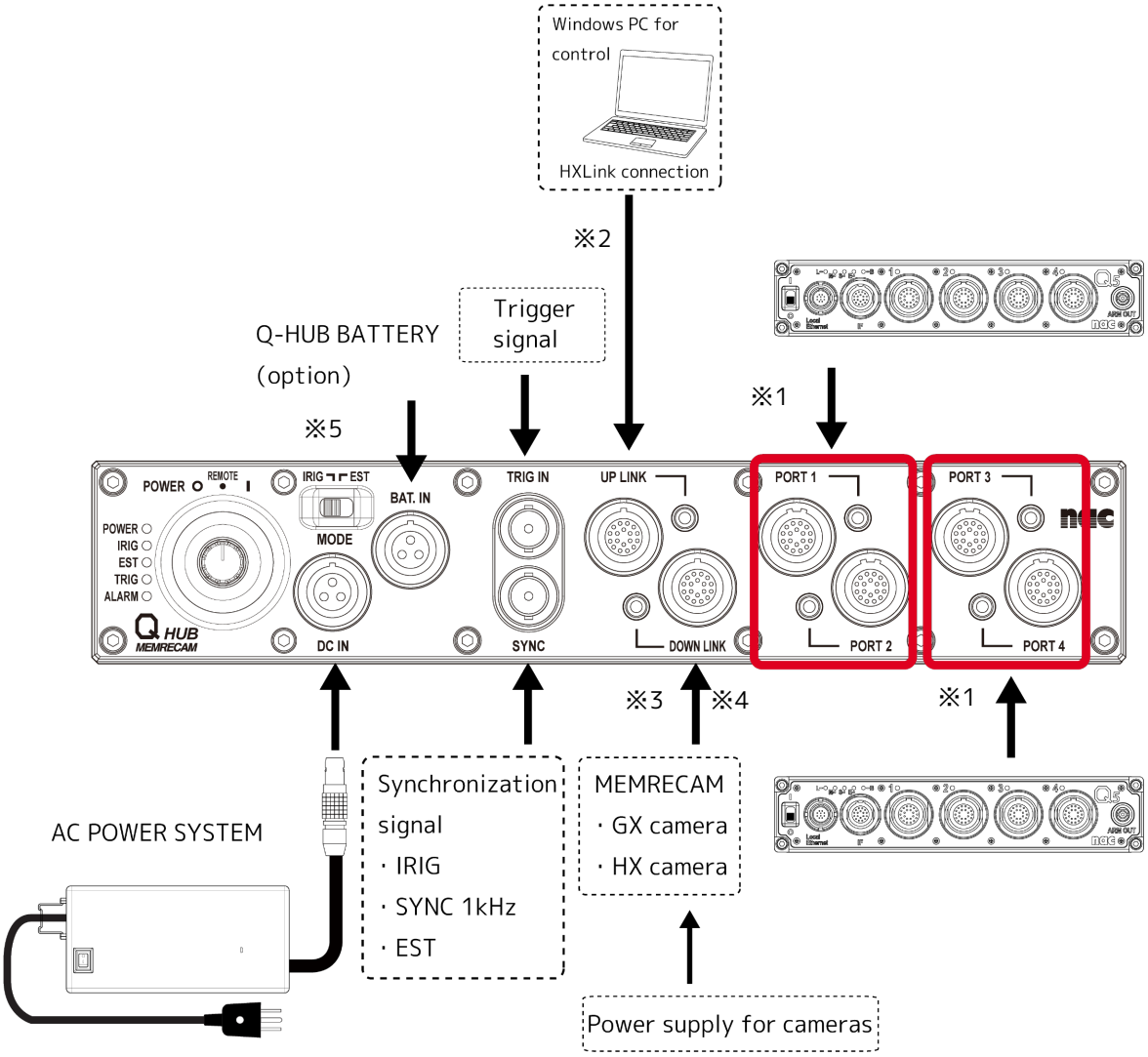
※4 GX remote cable (option) required.

※5 Simple J3 cable (option) required.

※6 J3 branch cable (option) required.

Attention • The GX-HUB and GX-HUBi cannot be connected to the DOWNLINK connector.

Connection Diagram　(with 1 Q-HUB)



※1　Q-Cam remote cable (option) required.

※2　J3 branch cable, or Simple J3 cable　(option) required.

※3　GX remote cable (for the GX-HUBi, option) required. Also, synchronous filming requires IRIG-B (AM) input to UPLINK.

※4　The GX-HUB and GX-HUBi cannot be connected to DOWN LINK.

※5　If not using EST, set the sync signal switch to IRIG.

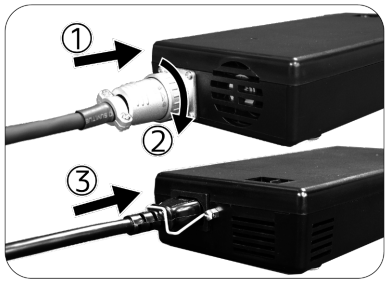
If connecting multiple Q-HUB (⏭🕮 6-16)

Connect to Power

Connect the AC POWER SYSTEM sold separately.

1 Turn the POWER switch OFF. (⏭🕮 6-8)

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



2 A Connect the cable to the AC power system

- Align the shape of the DC cable plug with the DC connector and push straight in (①). Turn the cable plug in the direction of the arrow (②) to lock the cable.
- Insert the AC cable into the AC connector (③).

3 Plug the AC cable into an outlet.

4 Connect the DC cable to the Q-HUB

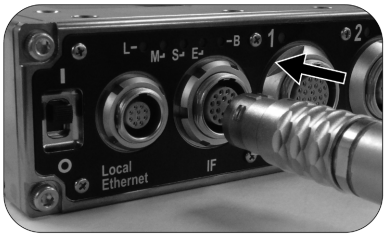
- Line up the DC IN connector on the Q-HUB with the red mark on the DC cable plug and insert until it clicks.
- When removing the DC cable from the Q-HUB, firmly grasp the plug and pull straight out.

Attention

- When removing the DC cable or AC cable, make sure the power to the Q-HUB main unit and the AC power system is OFF. Turn the power to the Q-HUB main unit OFF before turning the AC power system switch OFF.
- Do not open the cover to the AC power system. The areas generating high voltage are dangerous.
- Make sure to ground the unit. If not grounded, there is a risk of shock.
- If plugging a 3P-2P conversion plug or such into an outlet, make sure to use a grounding wire.
- Do not use an AC power system for the Q-HUB that is not manufactured by our company.
- See (⏭🕮 7-2) if using a Q-HUB battery pack.

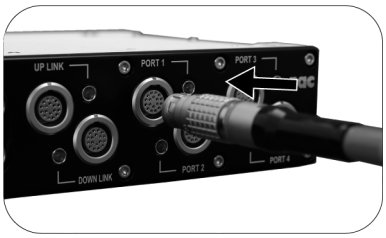
Connect the Q5

Connect the Q5 using the Q-Cam remote cable sold separately.



1 Connect the Q-Cam remote cable to the Q5

- Line up the IF connector on the Q5 with the red mark on the Q-Cam remote cable plug and insert until it clicks.



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

- Line up either the PORT1~2 or the PORT 3~4 connector on the Q-HUB with the red mark on the Q-Cam cable plug and insert until it clicks.

CHECK

- Connect the Q5 to either the PORT1~2 or the PORT 3~4 on the Q-HUB.

Attention

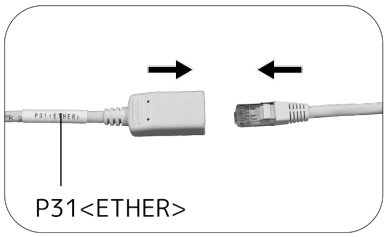
- Make sure to turn the Q5 and Q-HUB power OFF when plugging in and removing the cable.
- The Q-Cam remote cable is a cable dedicated to the Q5/Q1m/Q1v. It cannot be used with the MEMRECAM GX series or the HX series.

Connect the Windows PC for control

Connect the PC using the Ethernet.

1 Connect the simple J3 cable to the UP LINK connector

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



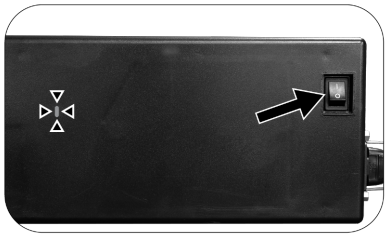
2 Connect the Ethernet cable to the simple J3 cable Ethernet connector. Connect to the Windows PC.

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

Turn the Power ON/OFF

Power on the Q-HUB.

Start up the Q-HUB



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

- After confirming that the AC cable and DC cable are connected to the AC power system and Q-HUB (⏭🕮 6-11), turn the switch ON.

The power switch LED for the AC power system will light up.

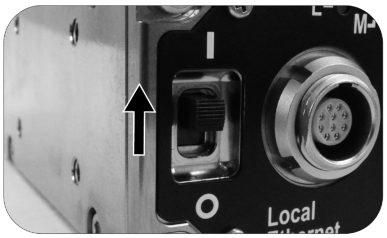
2 Turn the power switch on the Q-HUB in the direction of the arrow and turn ON.

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

3 Flip the sync signal switch

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

Set to IRIG if the sync signals aren't used or if not using EST.



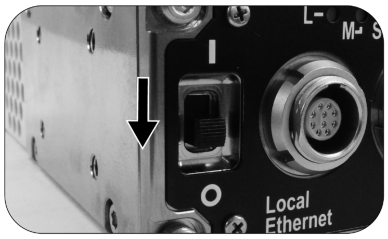
4 Turn the Q5 power ON

Attention • Do not flip the sync signal switch when the Q5 is in ARM.

Turn OFF power to the Q-HUB

1 Turn OFF the power between HX Link and each camera using the Windows PC

- Make sure to save any needed images before turning off.
- Disconnect each camera from HX Link.



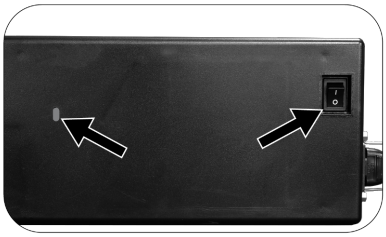
2 Turn the power OFF to the Q5

3 Turn the Q-HUB power switch in the direction of the arrow, to OFF

- Turn past REMOTE and click to OFF.
- The status LED for power will not be lit.

CHECK

- The Q5 connected to PORT 1～4 can be disconnected.
- The Q-HUB supplies power for the Q1m/Q1v memory backup when the Q-HUB power switch is in the REMOTE position.



3 Check that the status LED for POWER is not lit and then turn the power switch for the AC power system OFF

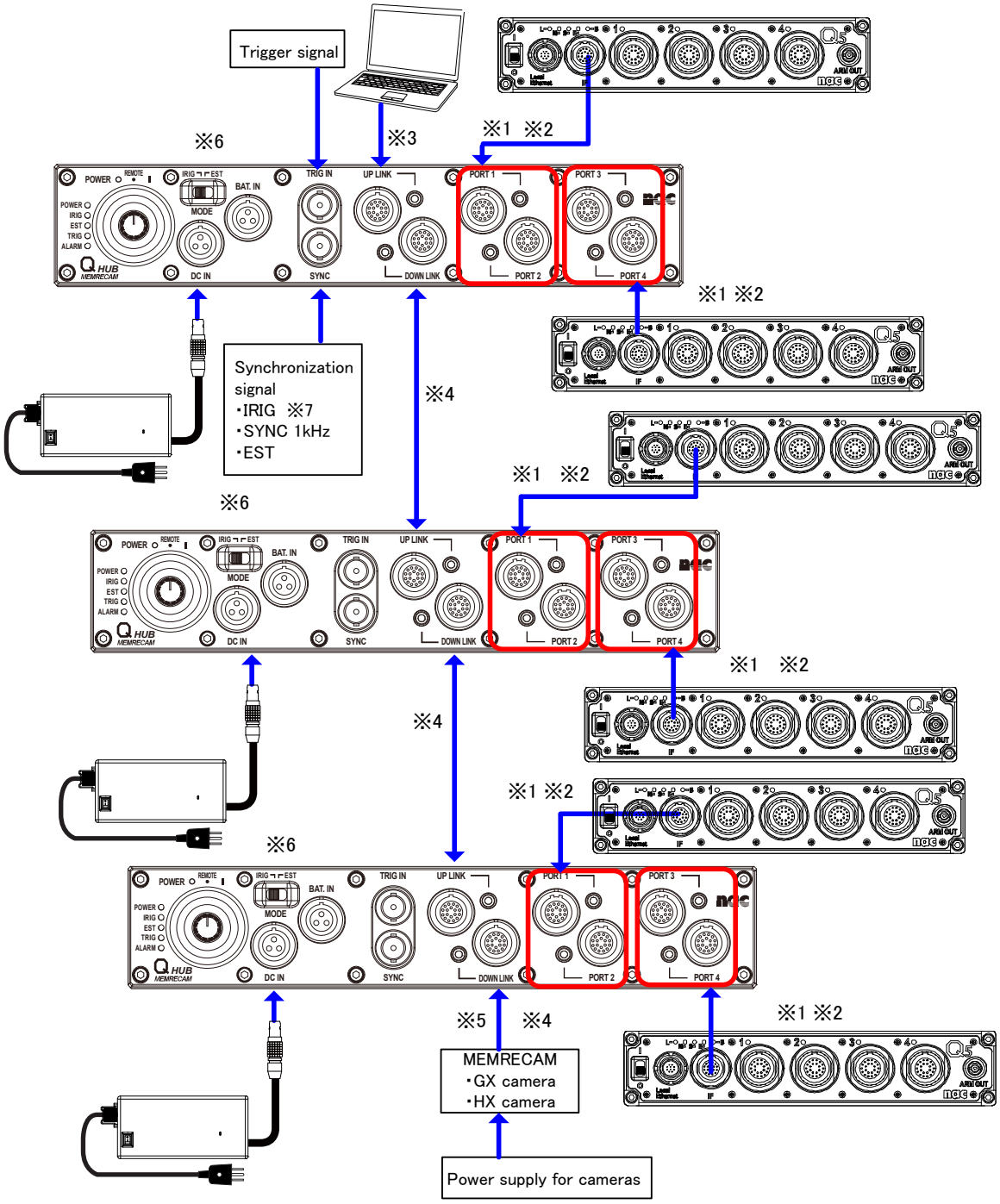
Attention

- If the AC power system switch is OFF when the Q5 memory backup battery is not charged, the recorded images will be deleted from the camera.
- Save any necessary recorded images to the control PC before turning off the power. Refer to “HXLink User’s Guide” for details.
- The Q-HUB uses a bit of power even when the power is turned OFF. If not using for long periods of time, disconnect from any external battery.

Connecting Multiple HUBs

When it connect more than one Q-HUB to connection and GX-HUB.

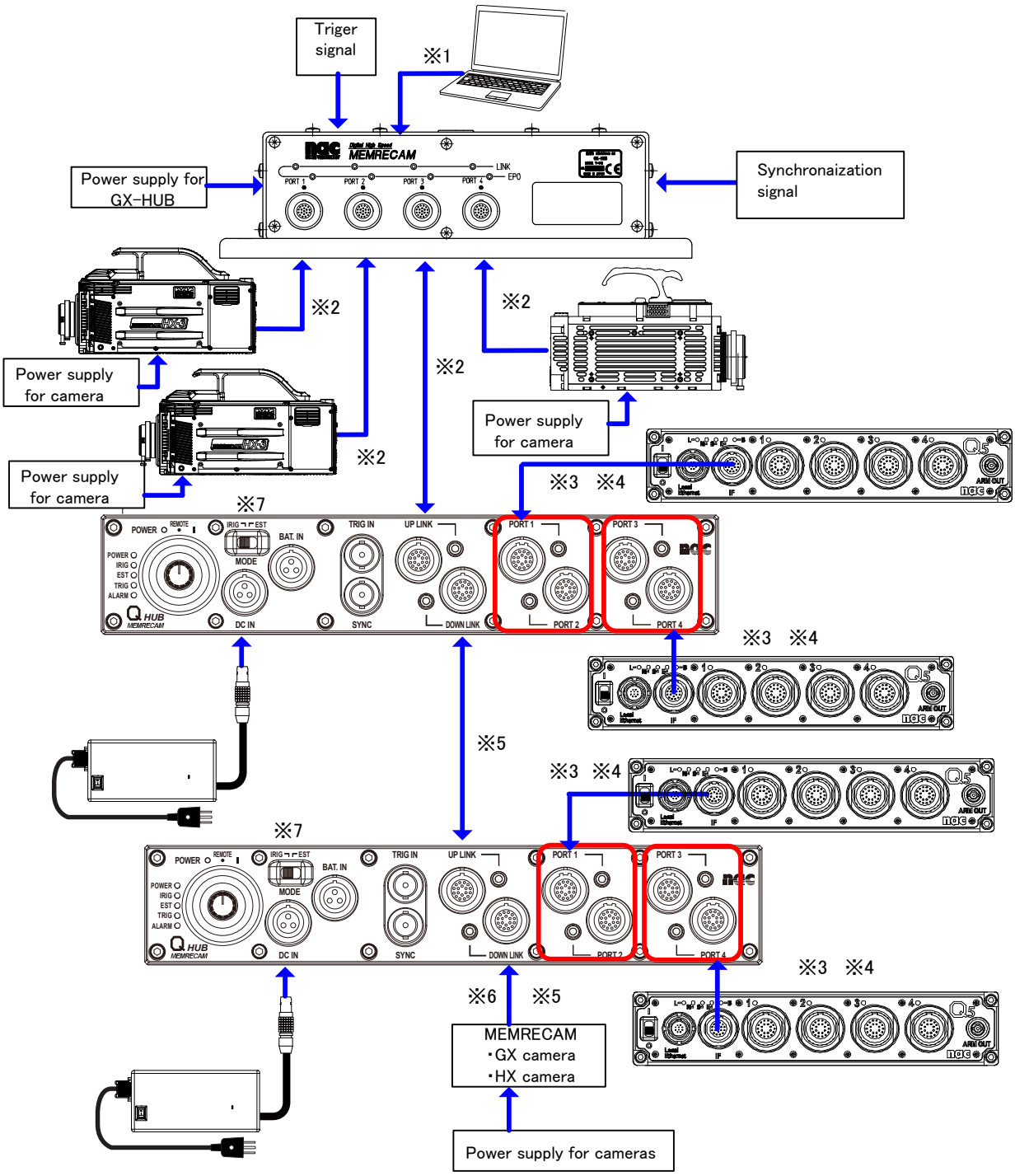
Connecting 3 Q-HUBs



※1 Connect the Q-Cam remote cable and provide camera power from the Q-HUB
※2 Connect either PORT1 or 2, PORT3 or 4 to 1PORT.
※3 Connect with the J3 branch cable or the easy J3 cable
※4 Connect with the GX remote cable (for GX-HUBi)
※5 The GX-HUB and GX-HUBi cannot be connected to DOWN LINK.
※6 If not using EST, set the sync signal switch to IRIG.
※7 To sync with the Q1m/Q1v for GX/HX camera exposure without using EST, do not input from SYNC but IRIG-B (AM) signals must be input from the UPLINK (J3 branch cable or such).

Attention
- Multiple cascade connections with Q-HUBs are dependent on the processing performance of the control PC used and the network environment. Target three levels.
- If using external batteries, they must be connected to the Q-HUB.

Connecting 1 GX-HUB and 2 Q-HUBs



※1 Connect with the J3 branch cable or the easy J3 cable
※2 Connect with the GX remote cable (for GX-HUB)
※3 Connect the Q-Cam remote cable and provide camera power from the Q-HUB
※4 Connect either PORT1 or 2, PORT3 or 4 to 1PORT
※5 Connect with the GX remote cable (for GX-HUBi)
※6 The GX-HUB and GX-HUBi cannot be connected to DOWN LINK
※7 If not using EST, set the sync signal switch to IRIG.

Attention
- Multiple cascade connections with Q-HUBs are dependent on the processing performance of the control PC used and the network environment. Target three levels.
- If using external batteries, they must be connected to the Q-HUB.

Specifications

Power Switch

Power Switch	Rotary style SW (3 positions)	
	○ (OFF) :	Power OFF
	REMOTE :	ON/OFF according to power control signals Power for Q5 memory backup provided.
	| (ON) :	Power ON

Sync Signal Switch

MODE Switch	Sliding style SW (2 positions)	
	IRIG :	Set sync signal to IRIG B (DCLS, AM) or SYNC 1kHz (factory setting)
	EST :	Set sync signal to EST

Status LED

POWER	Green :	Power ON
	Not lit :	Power OFF
IRIG	Green :	IRIG B (DCLS, AM) signal or 1kHz input, and locked (sync switch is IRIG)
	Red :	No IRIG B (DCLS, AM) signal or 1kHz input, or input but not locked. (sync switch is IRIG)
	Not lit :	Sync signal switch set to EST
EST	Green :	Sync signal switch set to EST
	Not lit :	Sync signal switch set to IRIG
TRIG	Green :	After trigger signal input, lit for 1 second (then not lit) Or continues to be lit when trigger signal input continues for less than 1 second
	Not lit :	No trigger signal
ALARM	Red :	When there is an overcurrent, overvoltage, or low voltage detected in the power line
	Not lit :	Normal

UPLINK/DOWNLINK/PORT 1～4　LED

Green：	Ethernet link established
Not lit：	Not connected or no link established

DC IN connector

Application	Power input
Model	LEMO EGG.2B.303
Compatible Plug	LEMO FGG.2B.303
Power Voltage	DC20 - 32V
Power Consumed	Max of approximately 140W (AC power system sold separately)
Power Protection	Reverse polarity： Internal protection circuit Overcurrent：Internal protection circuit　Approximately 12A Overvoltage：　35VDC　1 minute Low voltage：　Approximately 19VDC

Pin Arrangement

Pin No.	Name	Direction	Function ・Input/Output Level	Notes
1	DC24V IN	IN	DC + Input	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 overcharge protection： 20VDC Prevents battery from dying by supplying 24V or more of power in DC IN.
Power Consumed	Max of approximately 140W (external battery sold separately)
Power Protection	Reverse polarity： Internal protection circuit Overcurrent：Internal protection circuit Approximately 12A Overvoltage： 35VDC 1 minute Low voltage： 20VDC

Pin Arrangement

Pin No.	Name	Direction	Function ・Input/Output Level	Notes
1	BAT24V IN	IN	DC + Input	Input DC22.5～32V
2	BAT_TMP	—	Thermister	
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 pullup resistance 4.7KΩ, isolation input L level : -0.5VDC (minimum applied voltage) ～ 0.8VDC H level : 2.0VDC ～ 5.5VDC (maximum applied voltage)
	Function :	H→L with trigger enabled, contact point input possible

Pin Arrangement

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	Ground isolation

SYNC connector

Application	Sync signal input
Model	BNC receptacle
Compatible Plug	BNC plug
Input	Signal level : TTL level, 5V pullup resistance 4.7KΩ, isolation input L level : -0.5VDC (minimum applied voltage) ～ 0.8VDC H level : 2.0VDC ～ 5.5VDC (maximum applied voltage) • IRIG B DCLS input • SYNC 1kHz input • EST input Function : Descending (H→L) : Start exposure Ascending (L→H) : End exposure

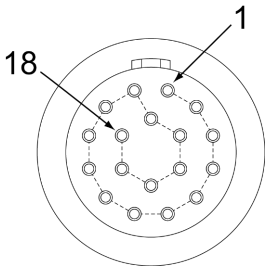
Pin Arrangement

Pin No.	Name	Direction	Function ・Input/Output Level	Notes
1	SYNC1 IN	IN	TTL	Isolation
shell	SYNC1 IN RTN	IN	SYNC1 input signal return	Ground isolation

UP LINK connector

Application	Branched input 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 pullup resistance 4.7KΩ, isolation input L level : -0.5VDC (minimum applied voltage) ～ 0.8VDC H level : 2.0VDC ～ 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～10Vp-p
TRIG2 IN	Signal Level :	Isolation, current loop with photocoupler, maximum applied voltage ± 32V, current limit resistance, 1.5KΩ, Trigger enabled at 5V or more
EPO/ARM Status	Signal Level :	5V CMOS output, isolation
	Function:	DOWN LINK, output AND operation for EPO input for PORT1～4
PWRCNT IN	Signal Level :	TTL level, 5V pullup resistance 4.7KΩ, isolation input L level : -0.5VDC (minimum applied voltage) ～ 0.8VDC H level : 2.0VDC ～ 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 Arrangement



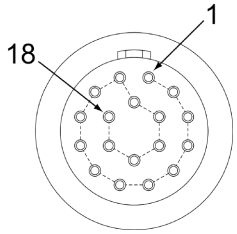
Pin Arrangement

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	SYNC2 IN	IN	TTL	Isolation
10	SYNC2 IN RTN	IN	SYNC2 input signal return	Ground isolation
11	IRIG-B IN	IN	IRIG-B (AM), 1Vp-p～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	Ground isolation
17	PWRCNT IN	IN	TTL or contact	Isolation
18	PWRCNT IN RTN	IN	PWRCNT input signal return	Ground isolation
shell	FRAME GND	—	Frame ground	

DOWN LINK connector

Application	Branched 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 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 OUT	Signal Level :	Isolation, IRIG B124 (AM) , 600Ω, 1Vp-p～10Vp-p
TRIG OUT	Signal Level : Function:	＋5V output, isolation Trigger enabled a current of 2.4mA or more Trigger disabled at current of 0.1mA or less
EPO IN	Signal Level : Function:	TTL level, 5V pullup, isolation L level : -0.5VDC (minimum applied voltage) ～ 0.8VDC H level : 2.0VDC ～ 5.5VDC (maximum applied voltage) Descending(H→L) : Start exposure Ascending(L→H) : End exposure
PWRCNT OUT	Signal Level : Function:	Switch circuit, isolation Open (Max voltage tolerance 5.5V) : Power ON Short : Power OFF

Pin Arrangement



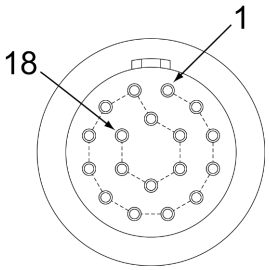
Pin Arrangement

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 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～10Vp-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 1～4connector

Application	Connect Q1m/Q1v with Q-Cam remote cable
Model	LEMO EGA2B.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 Approximately 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) ～ 0.8VDC H level : 2.0VDC ～ 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 voltage tolerance 5.5V) :Power ON Short: Power OFF

Pin Arrangement



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	SYNC1 (~4) OUT	OUT	CMOS LEVEL, 5V	Isolation
10	SYNC1 (~4) OUT RTN	OUT	SYNC output signal return	Isolation ground
11	DC1 (~4) OUT	OUT	DC +30V output	Camera power
12	DC1 (~4) OUT RTN	OUT	DC +30V return	Camera power
13	TRIG1 (~4) OUT	OUT	CMOS LEVEL, 5V	Isolation
14	TRIG1 (~4) OUT RTN	OUT	TRIG output signal return	Isolation ground
15	EPO1 (~4) IN	IN	TTL	Isolation
16	EPO1 (~4) IN RTN	IN	EPO input signal return	Isolation ground
17	PWRCNT1 (~4) OUT	OUT	Open (maximum voltage tolerance 5.5V), short	Isolation
18	PWRCNT1 (~4) OUT RTN	OUT	PWRCNT output signal return	Isolation ground
shell	FRAME GND	—	Frame ground	

Shape, Environment, Application Standards

Shape

External Dimensions (W×H×D)	Approximately W245×H48×D166mm (connector, excluding protruding parts)
Weight of the Main Unit	Approximately 2.2kg (Q-HUB unit only)

Environment

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

Compatible Standards

Safety Standards	EN60950
Electromagnetic Compatibility	EN55024, EN55032, EN55035, FCC Part 15 Class A, KN32, KN35

Main Options

AC POWER SYSTEM

External Dimensions (W×H×D)	Approximately 120 × 49.3 × 250 mm (not including connectors)	
Weight	Approximately 1.4 Kg	
Operating Temperature and Humidity	0～70℃, 5～95%RH (no condensation)	
Storage Temperature and Humidity	-40～85℃, 5～95%RH (no condensation)	
connector	Camera side：	NANABOSHI NET-243-RF
	AC：	AC 3 pin connector
Input	AC100～240V, 47～63Hz	
	DC28V, Max of 14.29A	

DC Cable between AC Power System and Q-HUB

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 cable

Length	1m 、3m、5m、7m、10m、15m、20m	
Cable diameter	Approximately 9.2mm	
Plug	Q-HUB, Q5 side：	LEMO FGA.2B.318 Clip preventing cable from coming out (locking clip) attached

J3 branch cable

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

J3 branch cable　(BNC receptacle)

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

Simple J3 cable

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

■GX-HUB　(G-resistant Model)

# of GX, HX camera connections	4
Power Input	DC20-32V Power consumed：Max of 12W (with the AC power system sold separately)
Power Switch	Yes, with ON/OFF function connecting GX-HUB
External Dimensions	Approximately W280 x H75 x D230 mm (connector, excluding protruding parts)
Weight	Approximately 4.1 kg (including mounting plate)
Operating Temperature and Humidity	-10～+40℃, 20～80%RH, no condensation
Storage Temperature and Humidity	20～+60℃, 20～80%RH, no condensation
Vibration	Conforms to MIL-STD-810C METHOD 514.2 CATEGORY b2 (RANDOM VIBRATION ENVELOPE)　FIGURE 514.2-2A
Impact	Half-sine, 11msec, 100G
connector	・Individual Input (BNC connectors 3) IRIG IN, TRIG IN, EST IN ・GXSYS (LEMO connector EGG.2B.318)　：Branched output with the GX-HUB, or J3cable (Gbit Ethernet, EPO：４ ports OR Output, IRIG IN, TRIG IN, EST IN, POWER CONT) ・FXSYS (MIL connector ACT90MC35SA)　：Connection with fx series M-HUB (corresponding to the fx series camera) ・Priority is FXSYS>GXSYS> Individual Input ・GXSYS (LEMO connector FWG.2B.318)　４ ports. Connect with GX SERIES camera J3 connector or GX-HUB GXSYS and J3 remote cable
LED Display	IRIG, TRIG, EST, LINK (Gbit Ethernet), POWER
Application Standards	Safety Standards: EN60950 Electromagnetic Compatibility: EN55022, EN55024, FCC Part 15 Class A, KN32, KN35

■GX Remote Cable　(for GX-HUB)

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

GX-HUBi

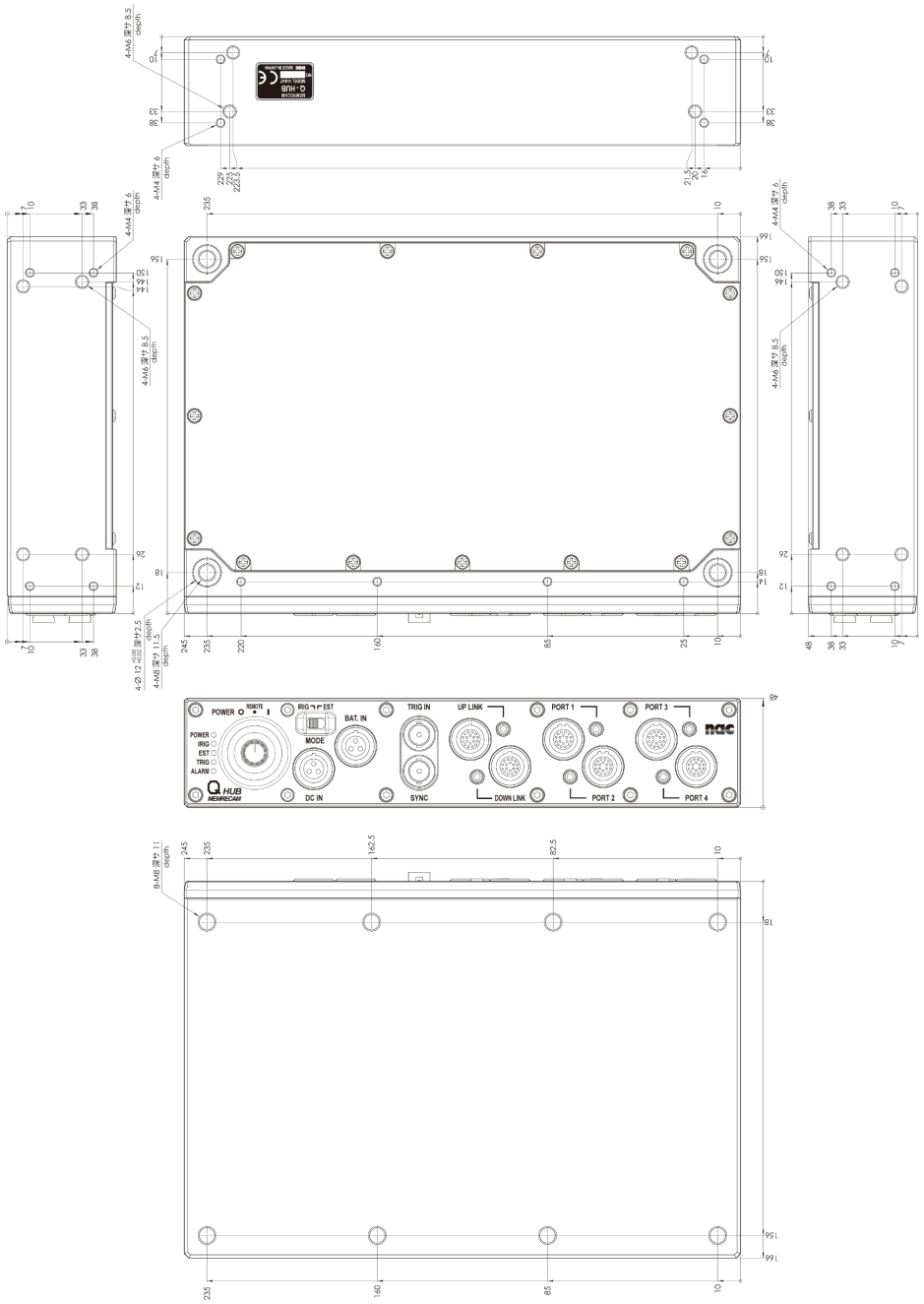
# of GX, HX camera connections	4
PowerInput	DC20-32V Power consumed : Max of 12W (with the AC power system sold separately)
Power Switch	Yes, with ON/OFF function connecting GX-HUB
External Dimensions	Approximately W270 x H72 x D200 mm (connector, excluding protruding parts)
Weight	Approximately 1.6 kg (including mounting plate)
Operating Temperature and Humidity	-10～+40℃, 20～80%RH, no condensation
Storage Temperature and Humidity	20～+60℃, 20～80%RH, no condensation
connector	・Individual Input (BNC connectorx 3) IRIG IN, TRIG IN, EST IN ・GXSYS (LEMO connector EGG.2B.318) ：Branched output with the GX-HUB, or J3cable (Gbit Ethernet, EPO：４ ports OR Output, IRIG IN, TRIG IN, EST IN, POWER CONT) ・Priority is GXSYS> Individual Input ・GXSYS (LEMO connector FWG.2B.318) ４ ports. Connect with GX SERIES camera J3 connector or GX-HUB GXSYS and J3 remote cable
LED Display	IRIG, TRIG, EST, LINK (Gbit Ethernet) , POWER
Application Standards	Safety Standards: EN60950 Electromagnetic Compatibility: EN55022, EN55024, FCC Part 15 Class A

GX remote cable (for the GX-HUBi)

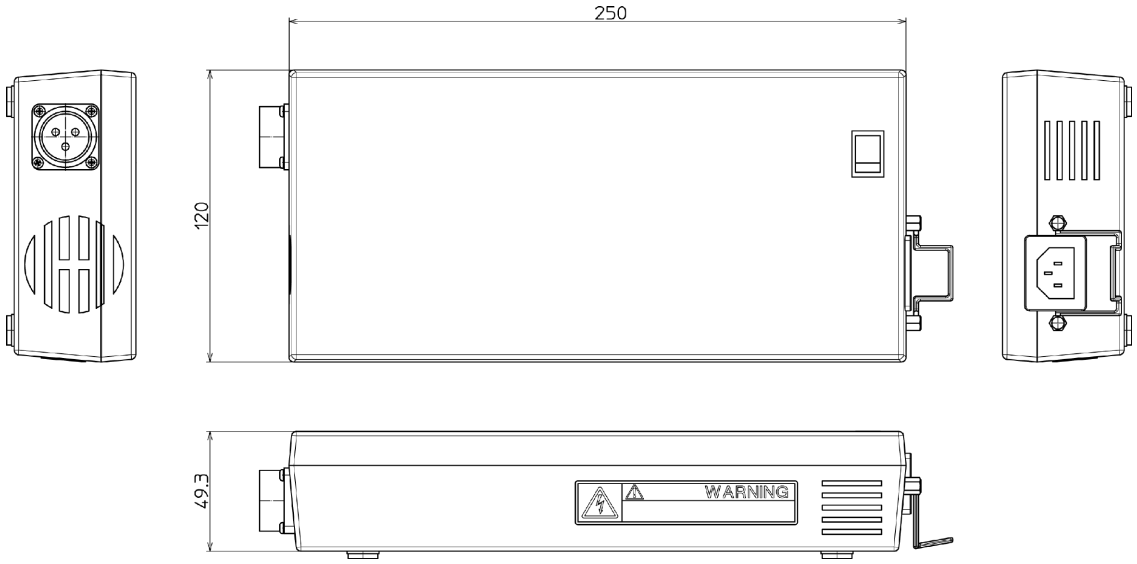
Lengths	1.5m 、3m 、5m、7.5m、10m、15m、20m、25m、30m、35m、40m、45m、50m、55m、60m、65m、70m、75m、80m、85m、90m、95m、100m
Cable diameter	Approximately 9.2mm
Plug	GX-HUB, Q-HUB side： LEMO FGG.2B.318

Dimensional Drawings

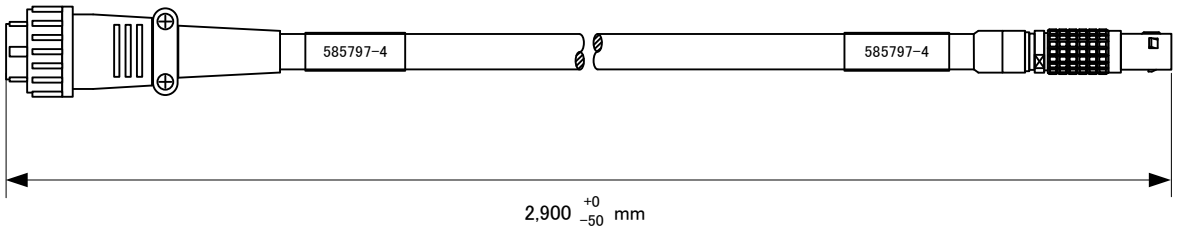
Q-HUB



AC POWER SYSTEM

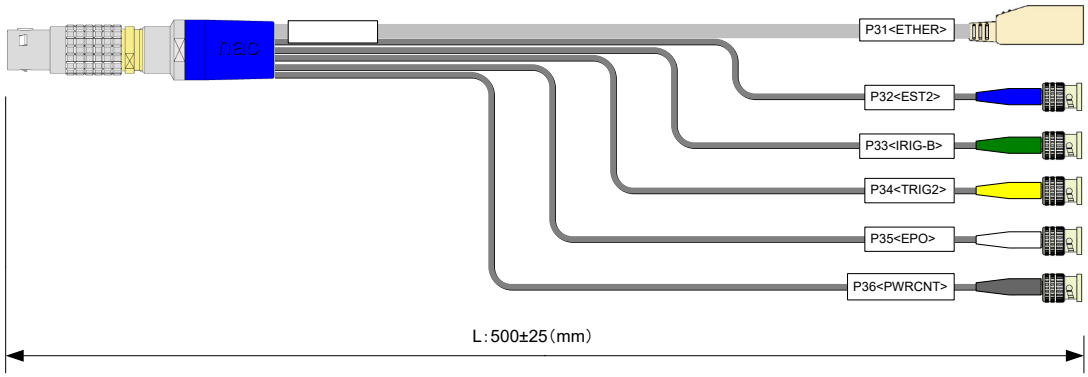


DC cable between AC power system and Q-HUB

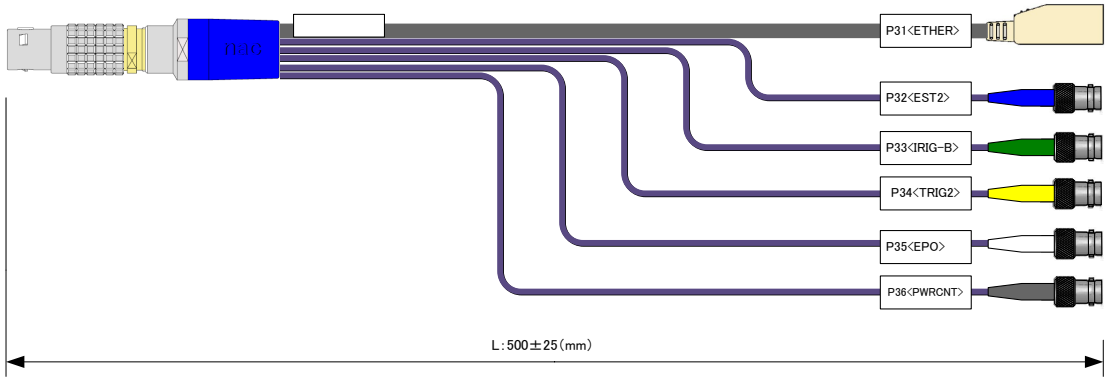


Q-Cam remote cable

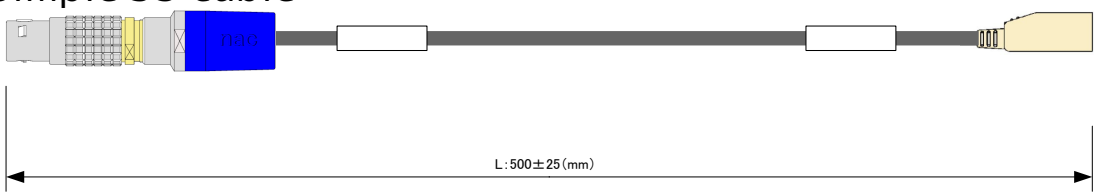
J3 branch cable



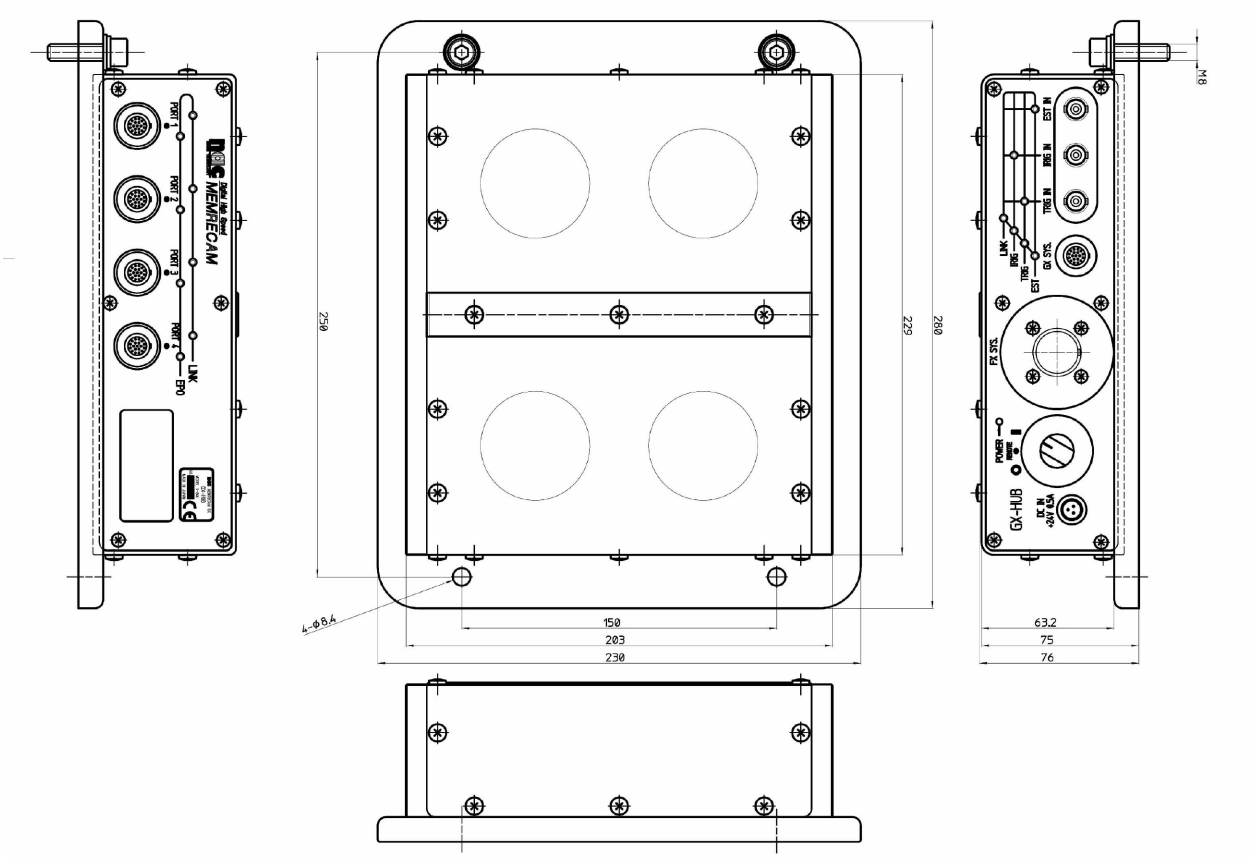
J3 branch cable (BNC receptacle)



Simple J3 cable

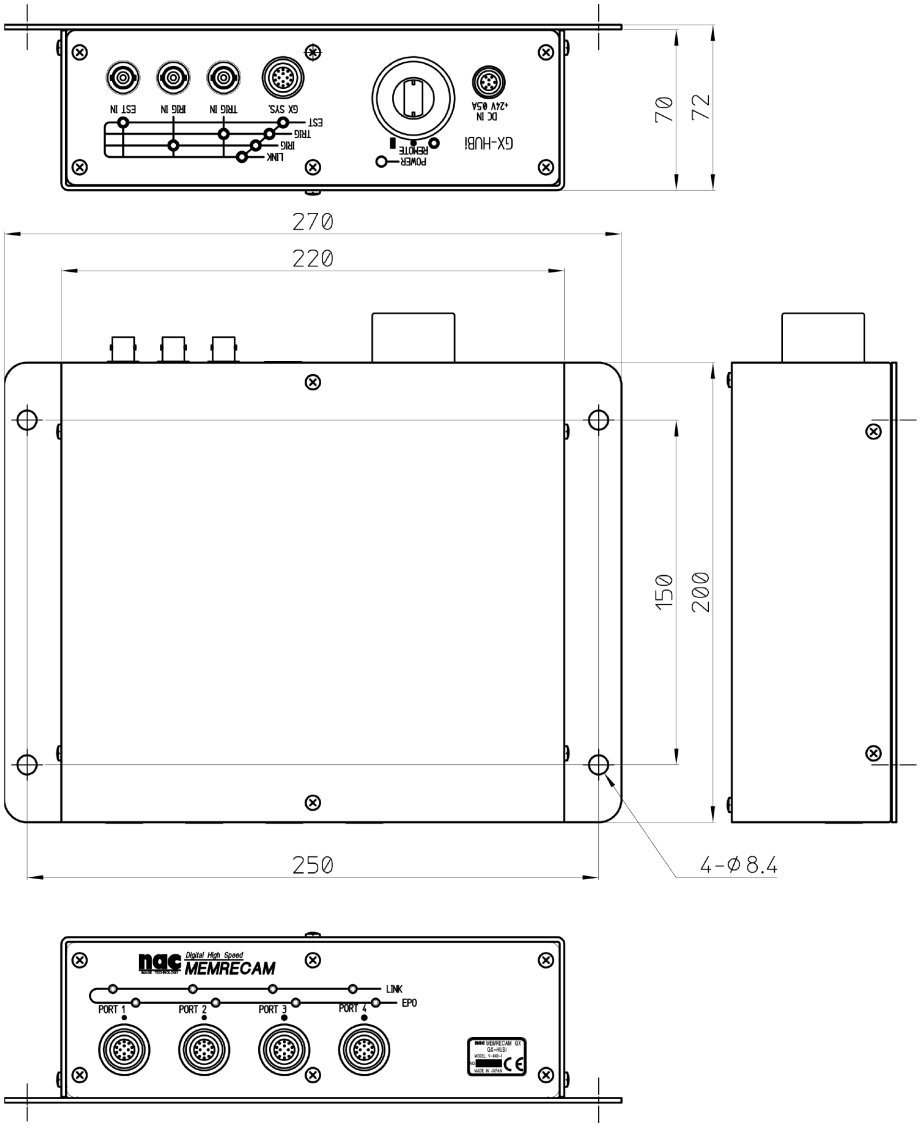


GX-HUB



GX remote cable (for GX-HUB)

GX-HUBi



GX remote cable (for GX-HUBi)

7

Q-HUB BATTERY PACK

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Features

Compact battery option for the Q-HUB.

Mounting to the Q-HUB

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

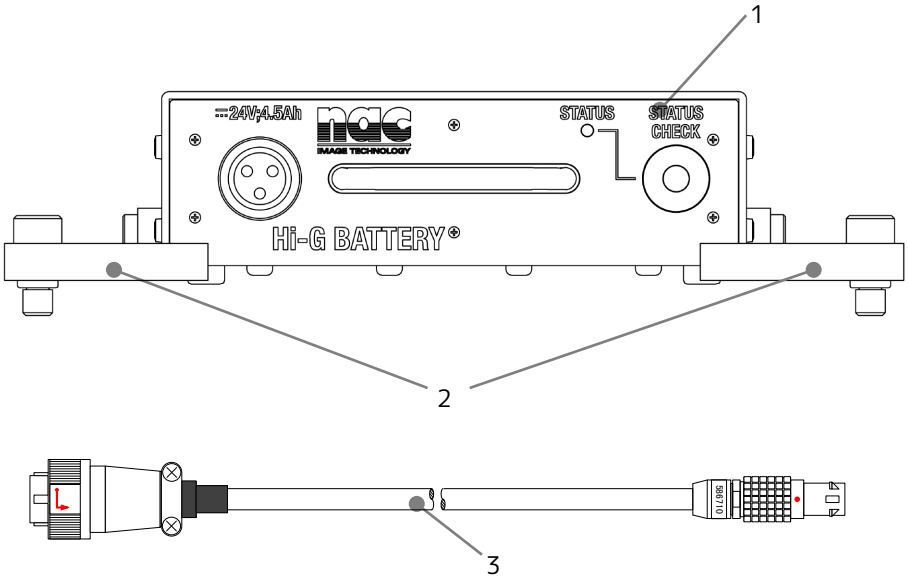
Can be used vertically with the special option

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

Verify the Components

The Q-HUB BATTERY PACK includes the following.
Make sure all are included.

Q-HUB BATTERY PACK



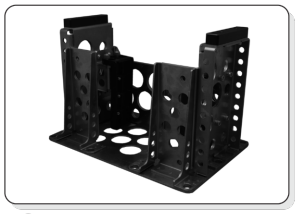
1 24V Hi-G BATTERY
2 BATTERY ADAPTER
3 Q-HUB BATT CABLE

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

Main Accessories

The following main accessories are available.

● 24V BATTERY CHARGER SYSTEM



● BRACKET BATTERY

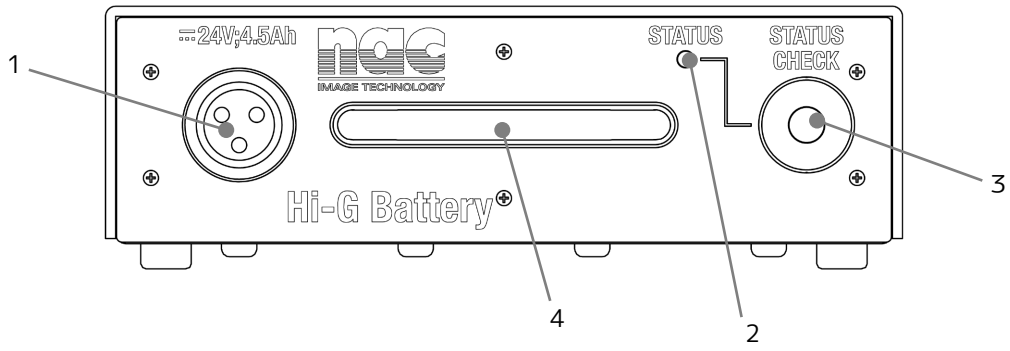
- 24V BATTERY CHARGER SYSTEM : Q-HUB BATTERY PACK charger
- BRACKET BATTERY : Q-HUB and Q-HUB BATTERY PACK fixed metal fittings. Can be mounted vertically.

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

External Appearance and Names to Each Part

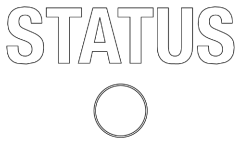
24V Hi-G BATTERY External Appearance and Names

Front



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

Status Display Light



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

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

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

Charging

Charges the Q-HUB BATTERY PACK.

Charging

Charges the 24V BATTERY CHARGER SYSTEM sold separately.

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

1 Turn the power switch OFF

- Turn the power switch for the battery charger OFF "○".

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

- Line up the indentations on the charger connector and the cable plug and plug straight in (①).
- Plug the AC cable straight in to the AC IN connector (②).

3 Plug the AC cable into an outlet

4 Turn the power switch ON

- Turn the battery charger power switch ON " | ".
  The switch LED will light up in green.
- CHARGE will light up in red.

5 Charging is complete once CHARGE is lit in green

Turn the battery charger power switch OFF "○".

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

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

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

Cancellation of the Memory Effect

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

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

1 Turn the power switch OFF

- Turn the power switch for the battery charger OFF "○".

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

- Line up the indentations on the charger connector and the cable plug and plug straight in (①).
- Plug the AC cable straight in to the AC IN connector (②).

3 Plug the AC cable into an outlet

4 Turn the power switch ON

- Turn the battery charger power switch ON " | " (①) and press the DISCHARGE button (②).
- CHARGE will flash green.
- Once discharging is completed, CHARGE will automatically switch from flashing green to red and charging will start.

5 Charging is complete once CHARGE is lit in green

- Turn the battery charger power switch OFF "○".

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

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

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

Connect to the Q-HUB

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

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

1 Install the battery adapter

- Mount the battery adapter (included) to the 24V Hi-G battery.

2 Secure to the Q-HUB

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

3 Connect the cable

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

Mount the Bracket Battery

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

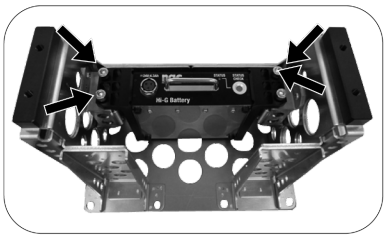
Attention • Turn the Q-HUB power OFF to connect.

1 Install the battery adapter

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

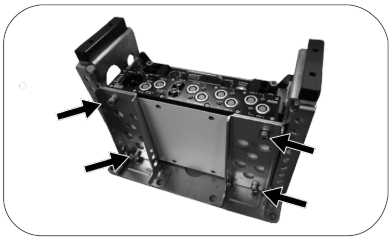
2 Mount the bracket adapter

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



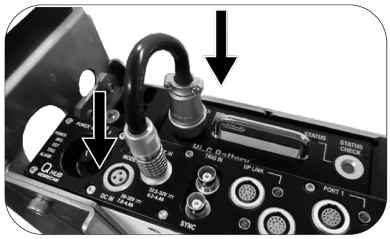
3 Secure to the bracket battery

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



4 Secure the Q-HUB

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



5 Connect the cable

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

Specifications

24V Hi-G BATTERY

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

Status LED

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

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

■DC OUT／Charge Connector

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

Pin Arrangement

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

■Connection Cable　Q-HUB BATT CABLE

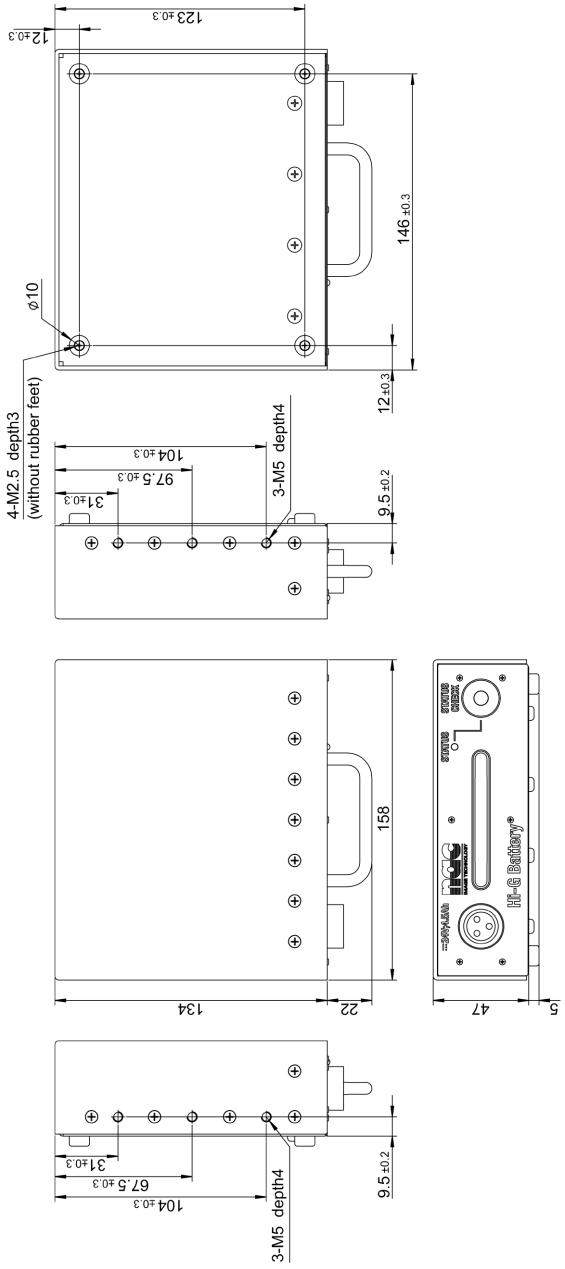
Length	0.095 m
Cable Diameter	7.7mm
Plug	BATTERY side：　Nanaboshi Electric Mfg. Co., Ltd. NR-203-PM-TUV Q-HUB side：　LEMO　FGG.2B.303

■BRACKET BATTERY (Option)

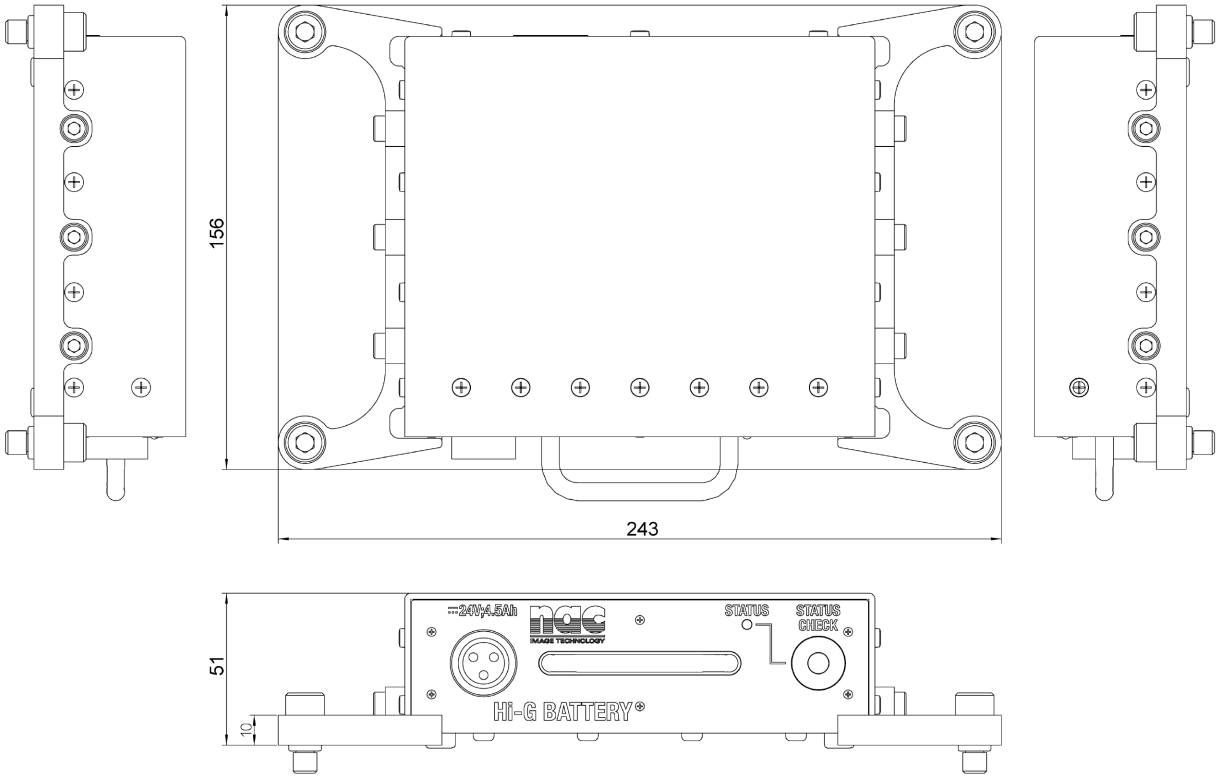
External Dimensions (W×H×D)	About W320×H225×D220mm (excluding the connector and protruding parts)
Weight	About 3kg

Dimensional Drawings

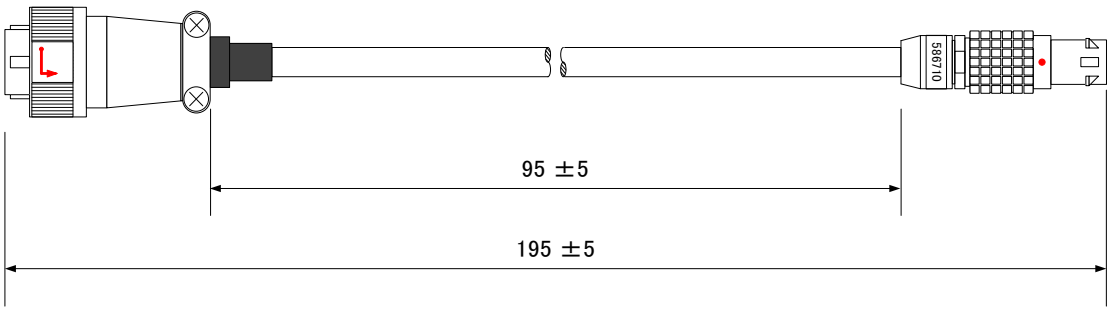
24V Hi-G BATTERY



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



Q-HUB BATT CABLE



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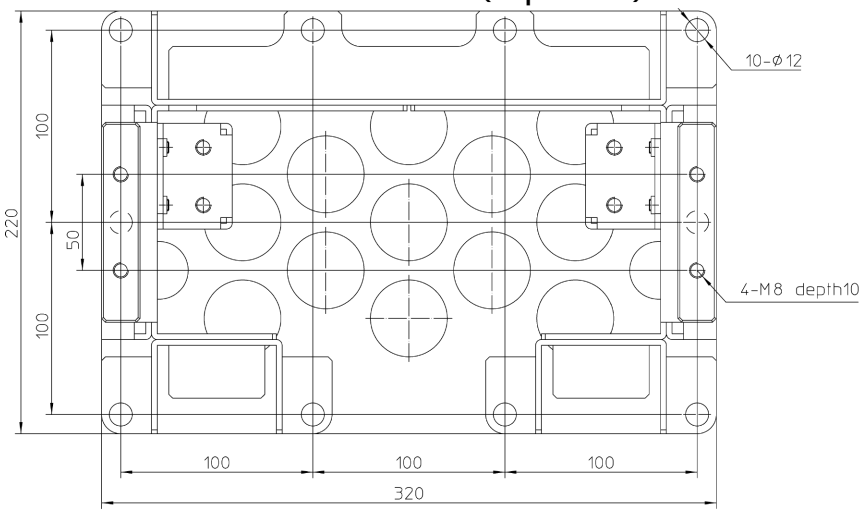
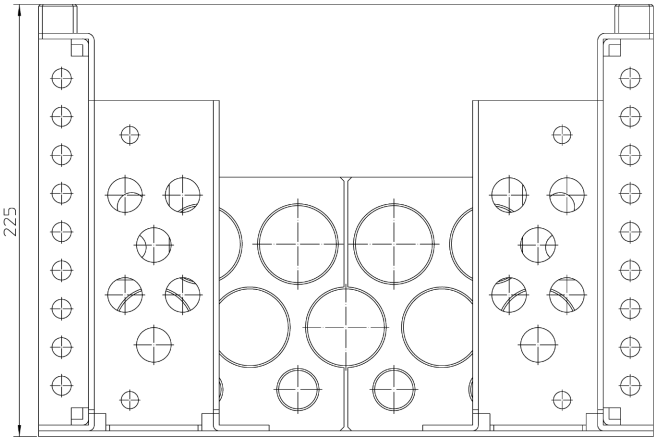
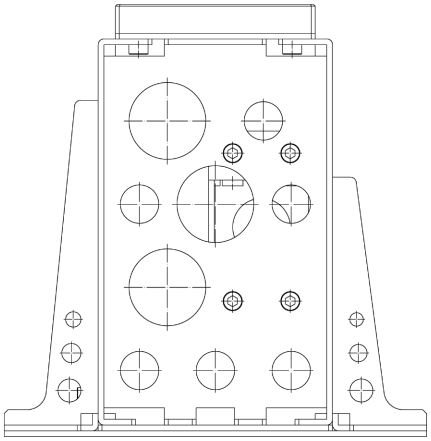
BRACKET BATTERY (Option)







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Contact

nac Image Technology Inc.

Manufacturer / distributor (overseas sales office)

■ USA Contact

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

■ European Contact

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

■ Japan/Asia Contact

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/