

MLink User's Manual

SP-650

nac Image Technology Co., Ltd.

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MEMRECAM MLink

SP-650 User's Manual

February 2025

Reference Number: 800435-0W

This manual describes the MLink version1.86.

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Introduction

Use MLink (this software) to control the MEMRECAM camera via the network, and digitally save the images taken to a PC.

This user's manual provides information on operations such as settings and applications to use the software equipped with these features.

Make sure you understand the contents of this manual and the user's manual for any peripheral devices, and are familiar with the operation before photographing anything important.

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Overview

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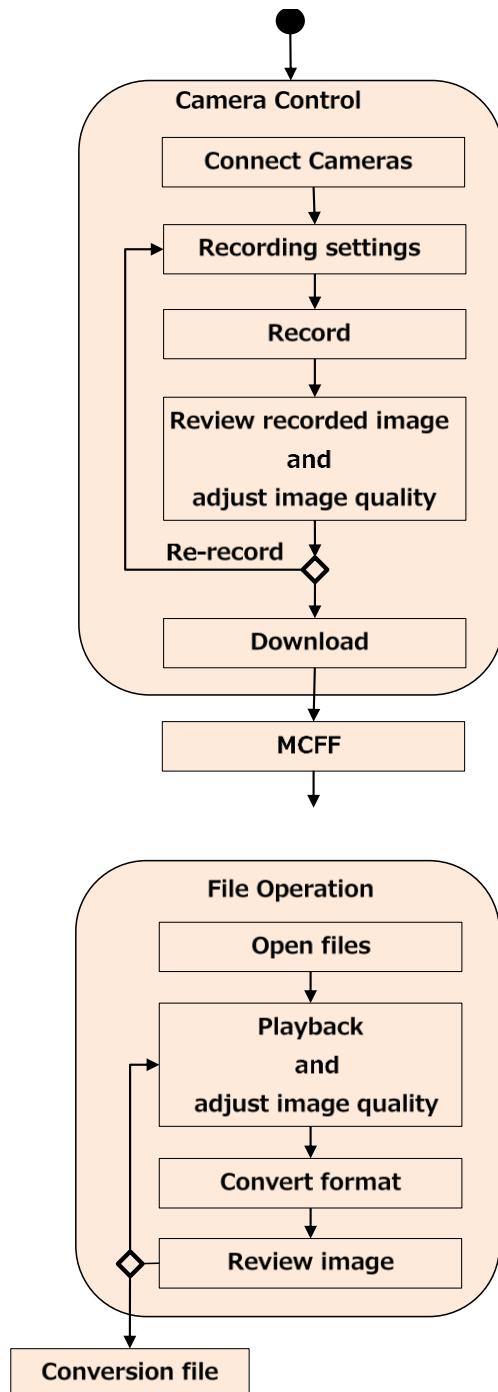
1. Overview

MLink controls the MEMRECAM camera, plays back the image file and converts the format.

1.1 Work Flow

The MLink work flow is as follows.

The operating procedures are explained according to this work flow.



1. Camera Control

- Search for and connect cameras
- Recording settings
- Record
- Review recorded image and adjust image quality
- Download

※ If necessary, make the applicable settings before recording.

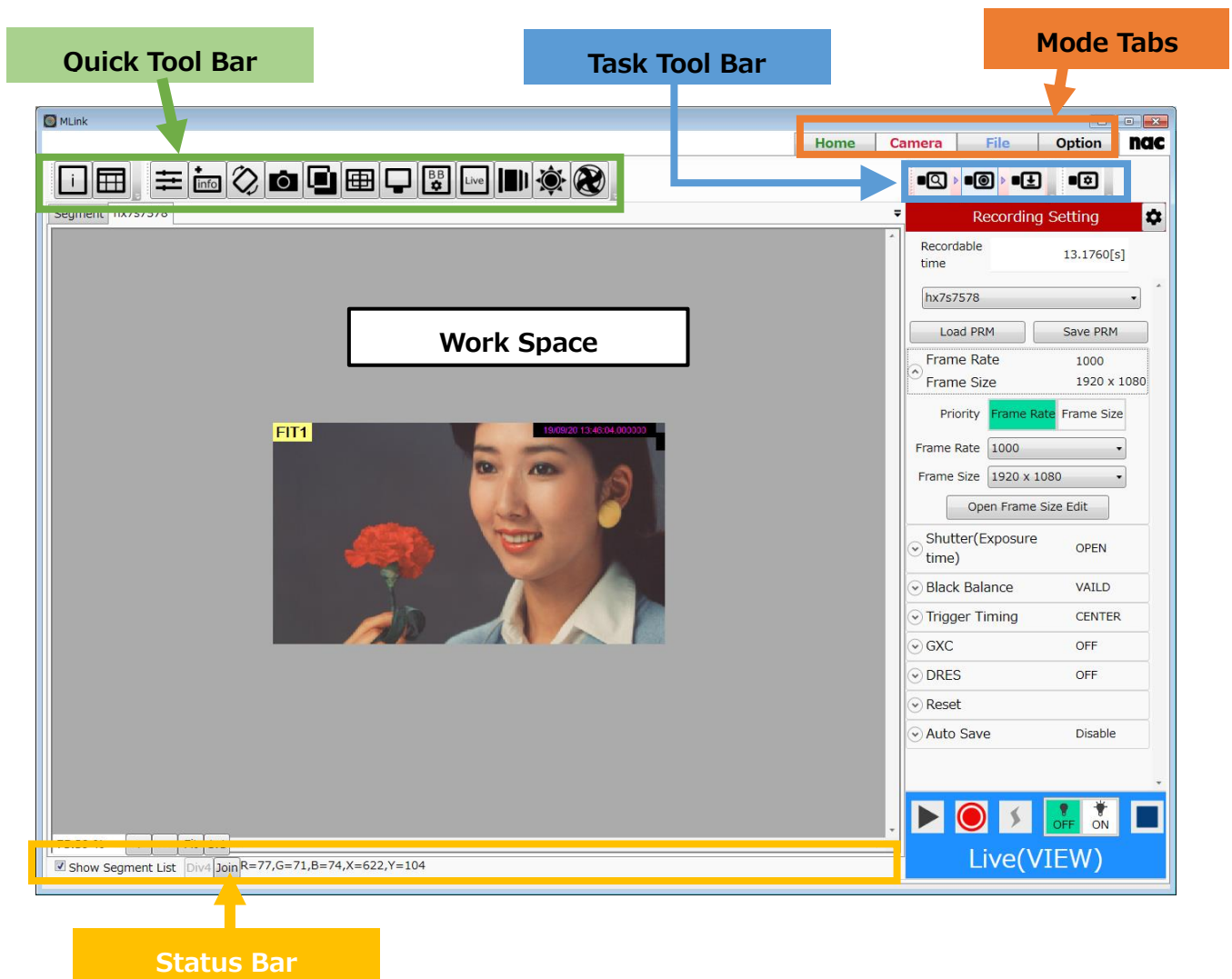
2. File Operation

- 1) Open files
- 2) Playback · adjust image quality
- 3) Convert format
- 4) Review image

1.2 Screen Layout

The following parts make up the screen layout of MLink.

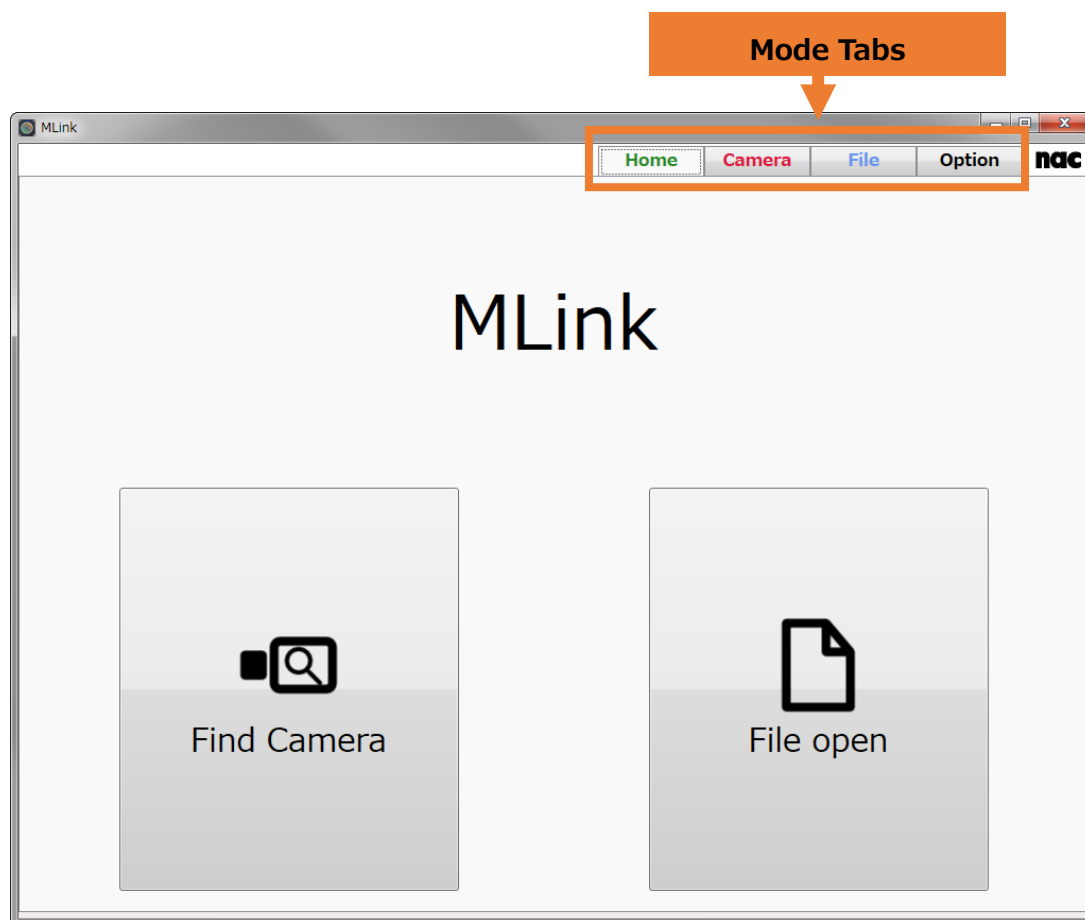
- **Mode Tabs** Switches the MLink modes.
- **Work Space** Displays images for working with them.
- **Task Tool Bar** Implements tasks according to the flow of the work.
- **Quick Tool Bar** Accesses functions that are frequently used.
- **Status Bar** Displays the descriptions of buttons.



Mode Tabs

The MLink modes are switched with the mode tabs. There are 4 mode tabs, as follows.

- Home Home screen. (⇒ Refer to p.6)
- Cameras Photographs by using the camera. (⇒ Refer to p.7)
- Files Plays back and converts image files. (⇒ Refer to p.8)
- Options MLink settings. (⇒ Refer to p.9)

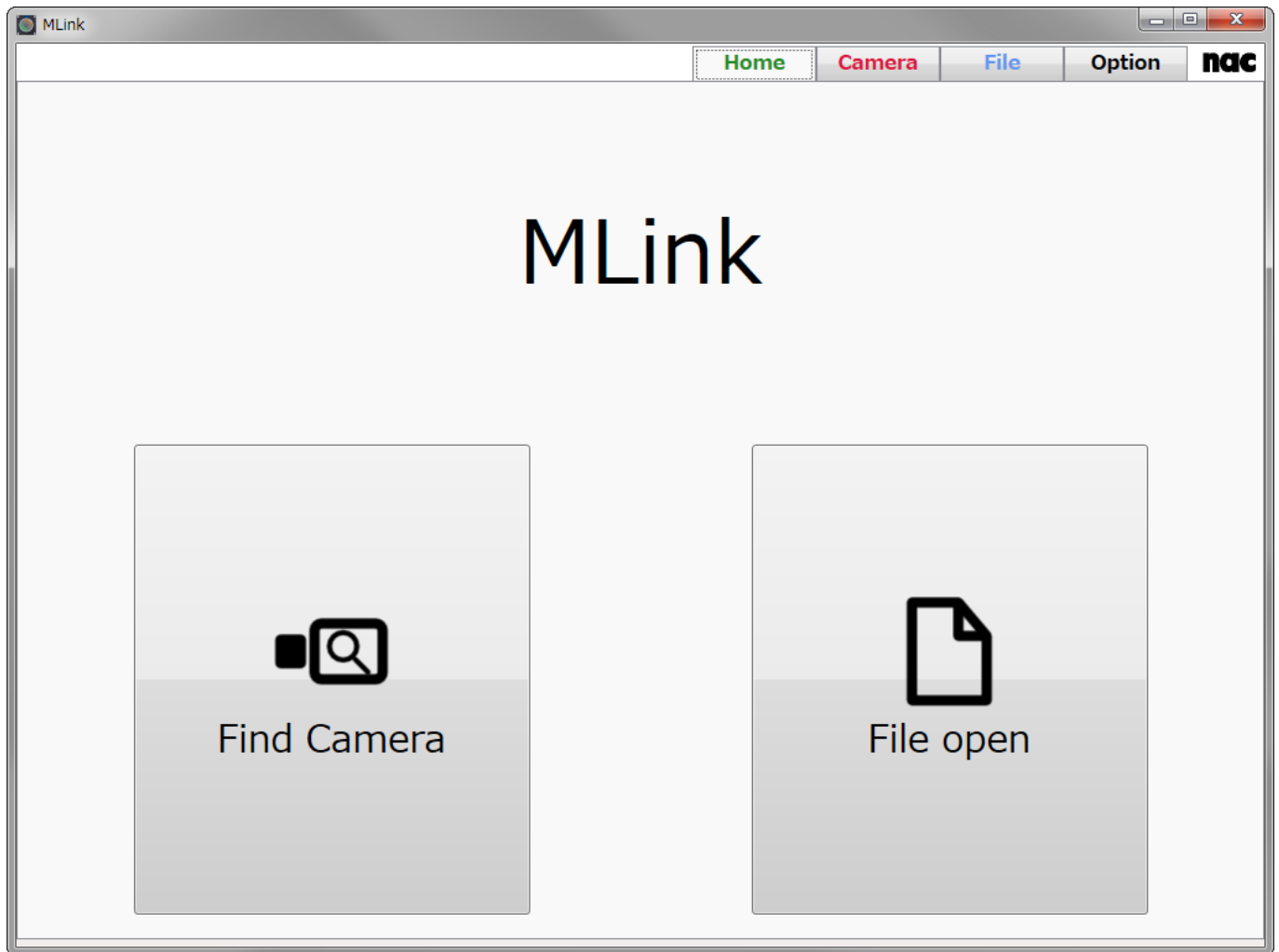


Home

Turn on MLink and the home screen is the first to be displayed.

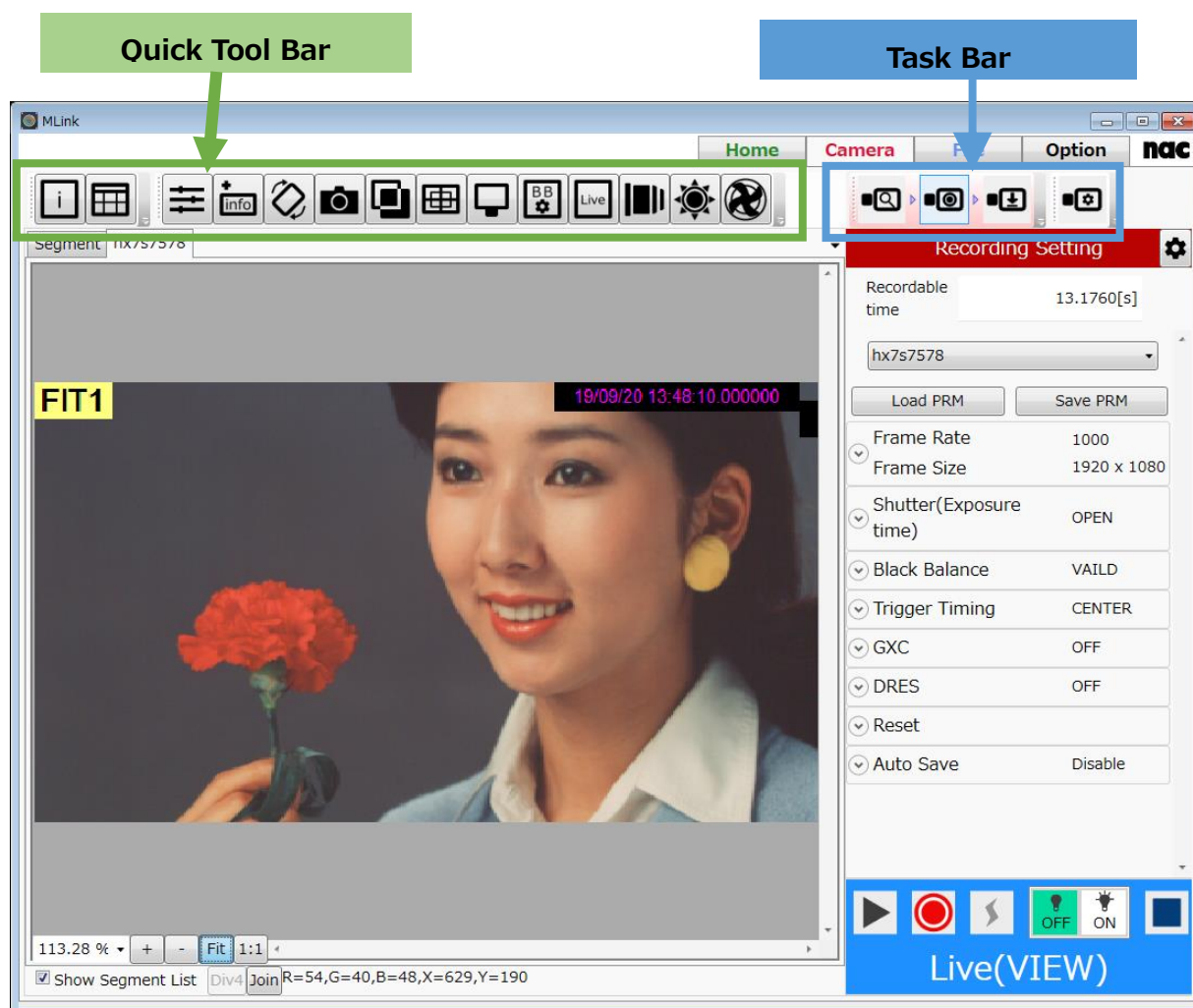
Use the camera tab to search for cameras. Use the file tab to open the select file dialogue.

Select the mode tab to switch between modes.



Cameras

Use the camera tab to control the cameras and download recordings and images.



The following two types of tool bars are found at the top of the screen.

- **Task Bar**

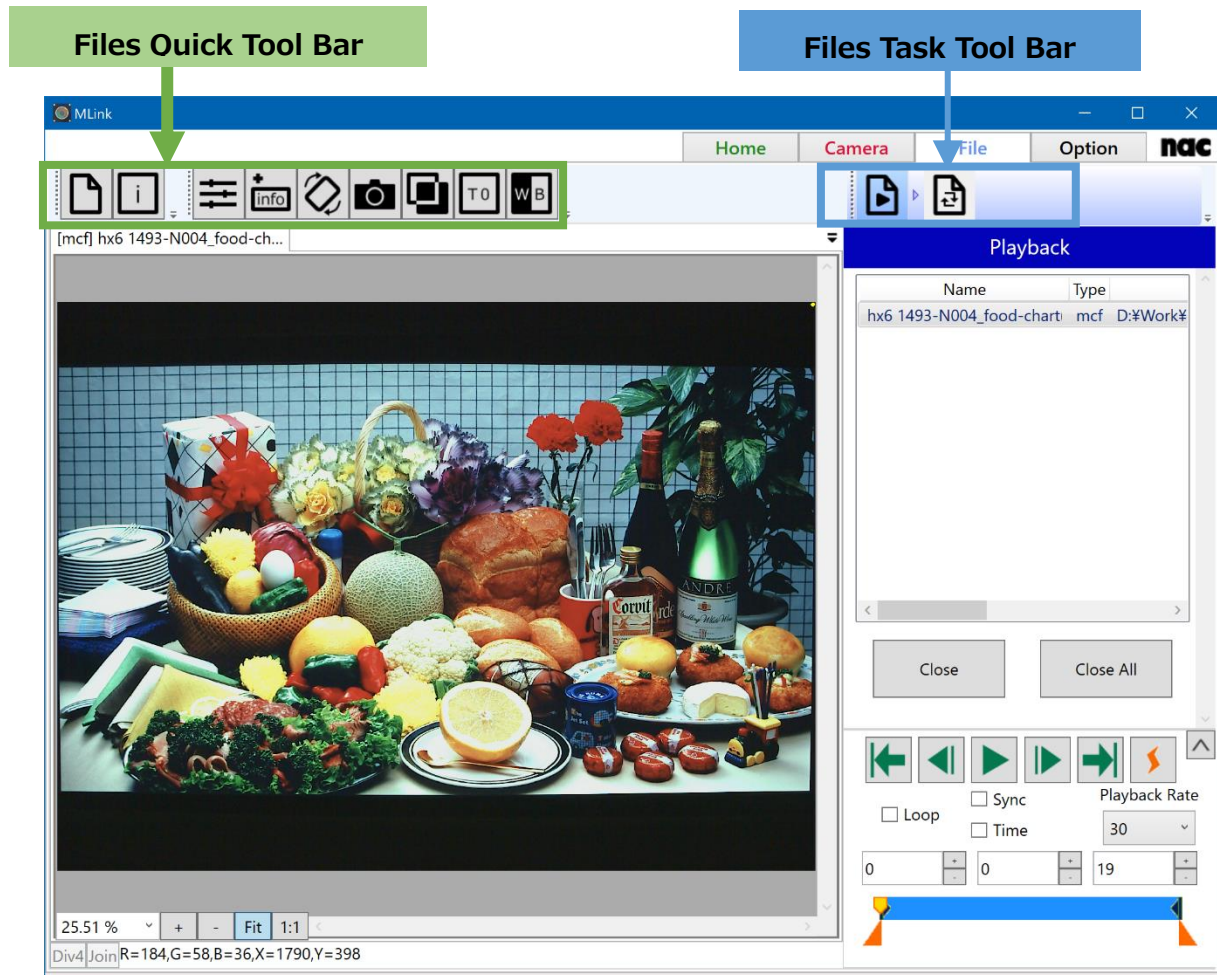
Record in the recording environment with the operations from left to right.

- **Quick Tool Bar**

Register settings required for photographing each time or functions used frequently so functions can be used with fewer operations. Register cameras and files separately.

Files

Use the file tab to open image files for playback, image adjustment and format conversion.



At the top of the screen, the following two tool bars are shown.

- **Files Task Tool Bar**

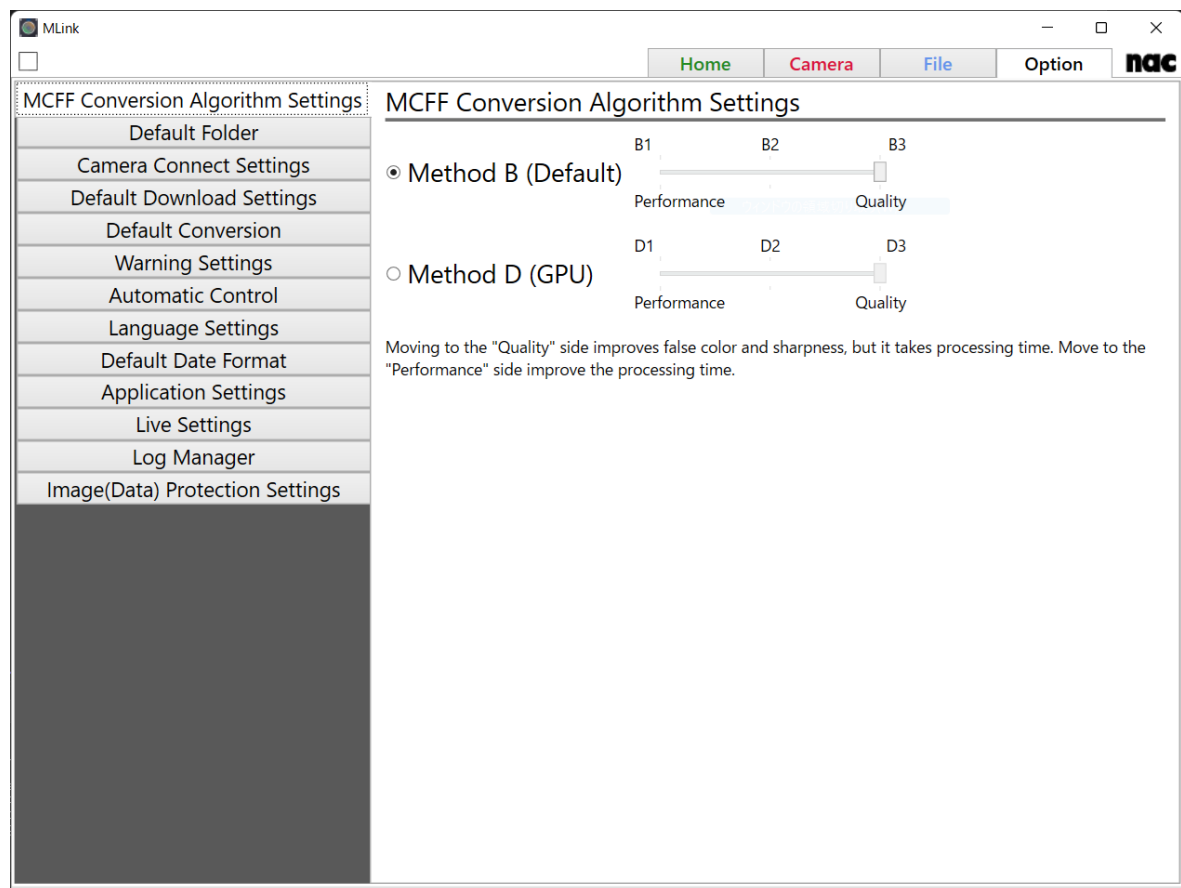
From left to right, adjust the image file quality or convert the format.

- **Files Quick Tool Bar**

Register functions used frequently, such as image quality adjustment for image files so functions can be used with fewer operations.

Options

Common MLink settings can be made in options.



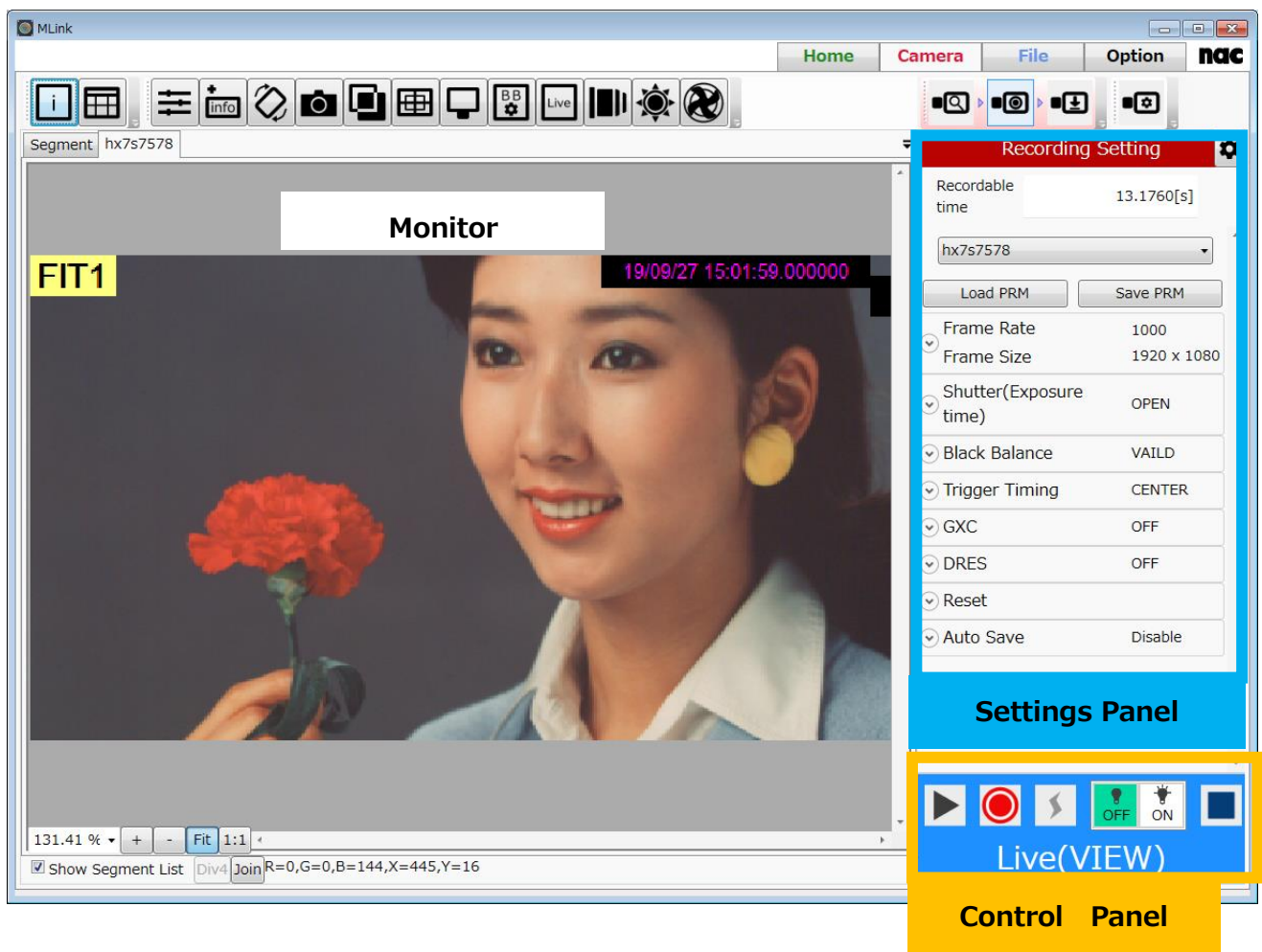
Refer to 4.4 Option Settings (refer to p.275) for details on how to set options.

Work Space

Displays cameras and image files, changes settings and controls the cameras.

The work space is divided into the following sections.

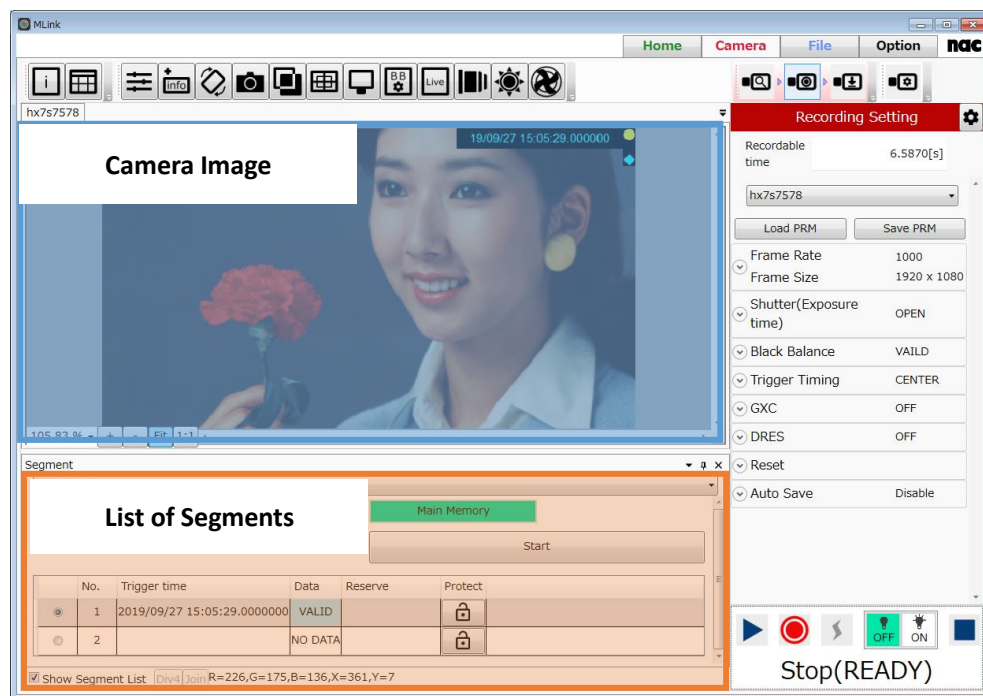
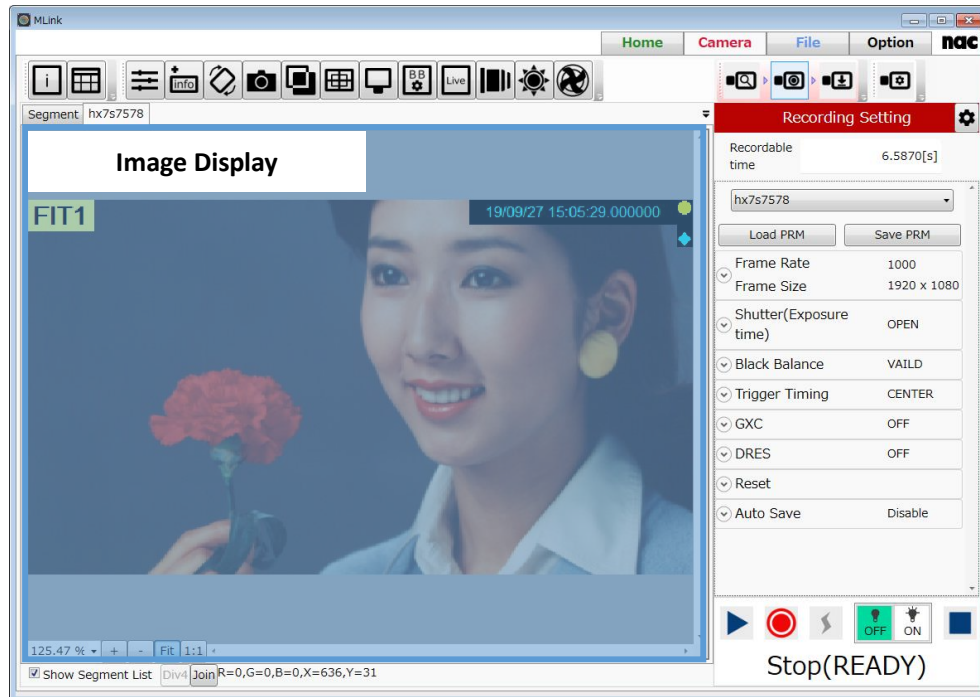
- **Monitor** Displays images. (⇒ refer to p.11)
- **Settings Panel** Changes the settings while verifying the images. (⇒ refer to p.12)
- **Control Panel** Controls the cameras and file modes. (⇒ refer to p.13)



Monitor

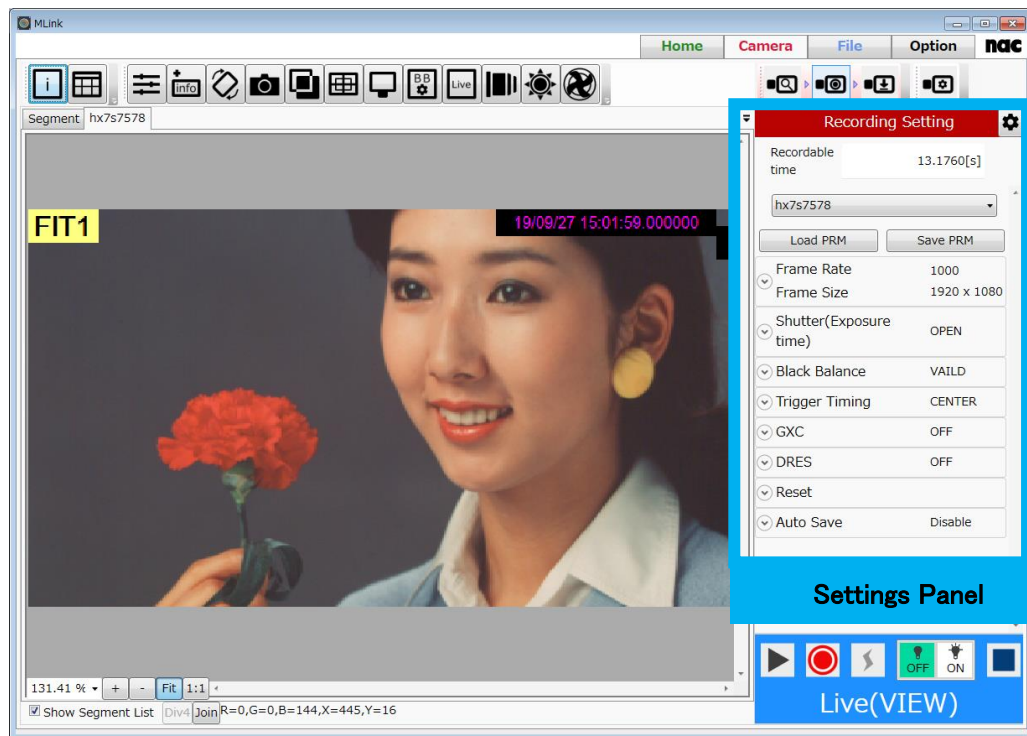
The camera or file images as well as the list of segments are shown on the monitor.

The camera images and list of segments can be shown stacked.



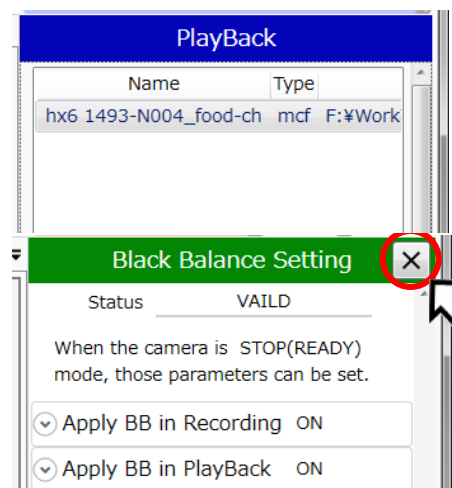
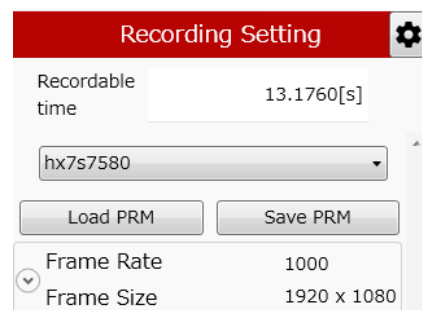
Settings Panel

The settings for the cameras and files can be changed in the settings panel.



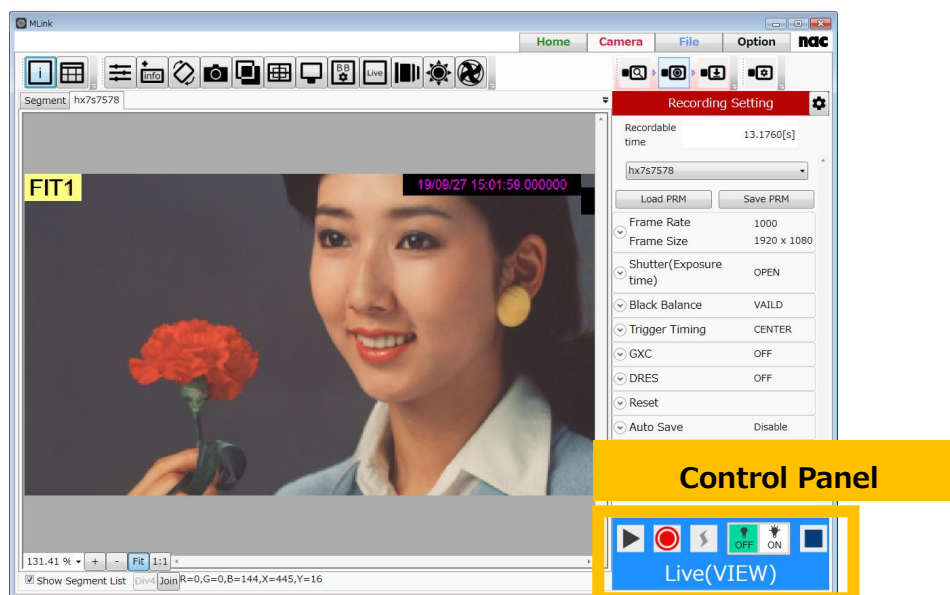
There are three types of settings panels, as follows.

- Red Panel
Camera settings panel.
- Blue Panel
File settings panel.
- Green Panel
Settings panel with the functions of the quick tool bar.
This settings panel can be closed with the x button at the top right of the panel.



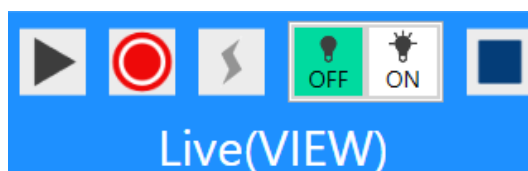
Control Panel

Camera recording control and playback control of cameras and files can be performed on the control panel.

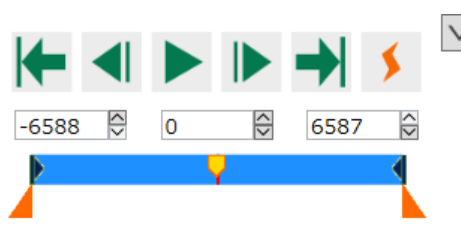


The three types of control panels are as follows.

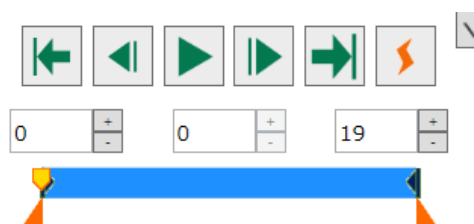
Camera Recording Control Panel



Camera Playback Control Panel



File Playback Control Panel



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2

Setup

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2. Setup

This provides a description of the procedures for installing and uninstalling MLink.

There may be times when the following preparations are required before installing.

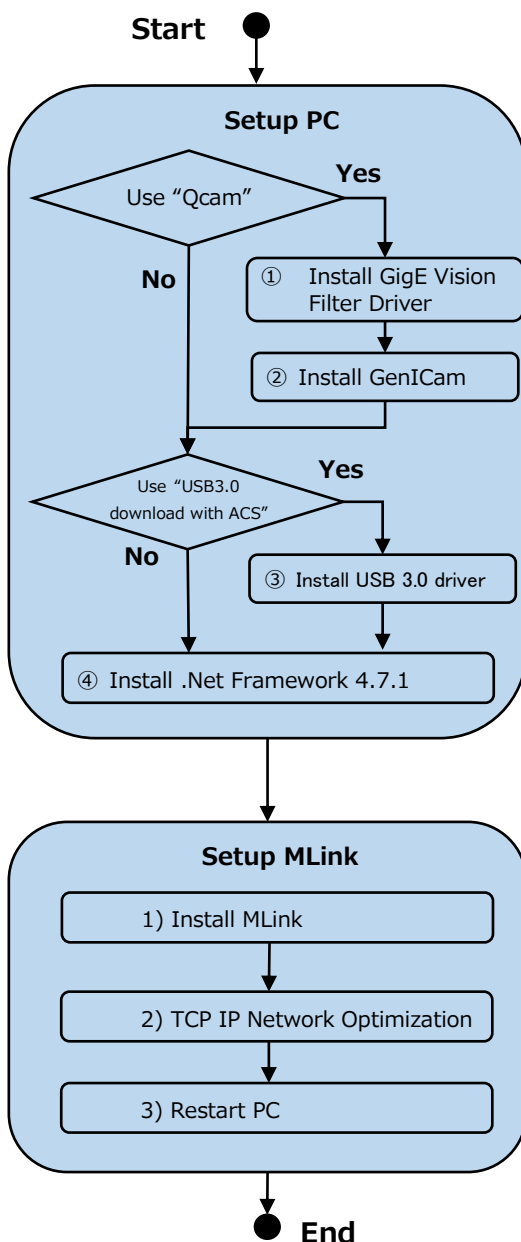
Please start the MLink installation after completing the following preparations.

While installing, a warning screen may appear depending on the anti-virus software.

For help, ask your network administrator.

2.1 Setup workflow

Follow the workflow shown below to explain the setup procedure.



■ Setup PC

① Install the GigE Vision Filter Driver

(⇒ Refer to p.18)

② Install GenICam (⇒ Refer to p.22)

When using Qcam you need to install ①, ②. If you do not use Qcam, you do not need to install it.

③ Install USB3.0 driver (⇒ Refer to p.23)

④ Install .Net Framework 4.7.1

(⇒ Refer to p.23)

Since .Net Framework 4.7.1 or higher is preinstalled from Windows 10 version 1709, it is not necessary to install it.

■ Setup MLink (Refer to p.27)

1) Install MLink

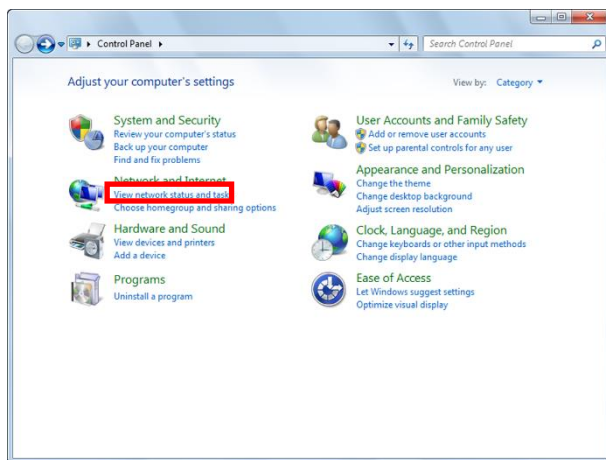
2) TCP IP Network Optimization

3) Restart PC

2.1.1 Install the GigE Vision Filter Driver

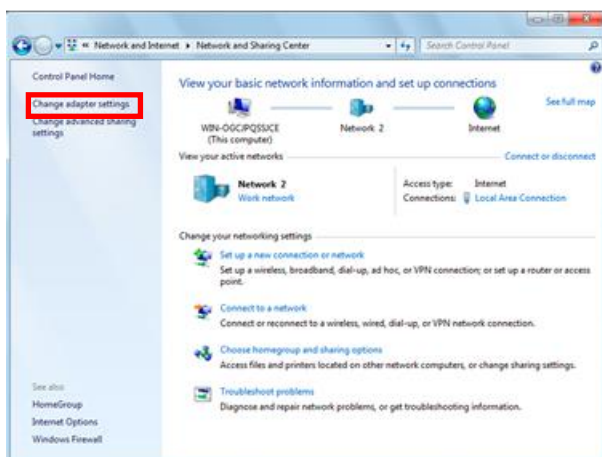
If controlling the Q camera, install the GenICam, GigE Vision Filter Driver that matches the Windows used. Confirm the Windows environment. Confirm the Windows environment in the next operation. Open "Control Panel" → "All Control Panel Items" → "System", and confirm either 32 bit/ 64 bit in "System Type".

If GigE Vision Filter Driver are already installed, refer to the procedures in "2.3 Uninstall" and uninstall.

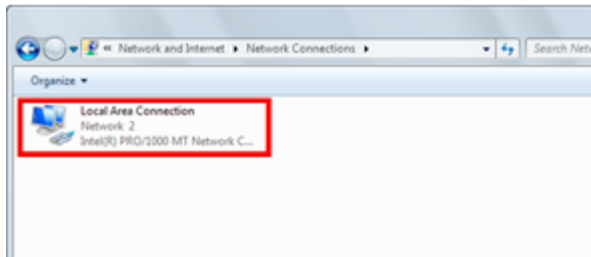


Open the control panel from the Windows start button.

Click "View network status and Task" to open.

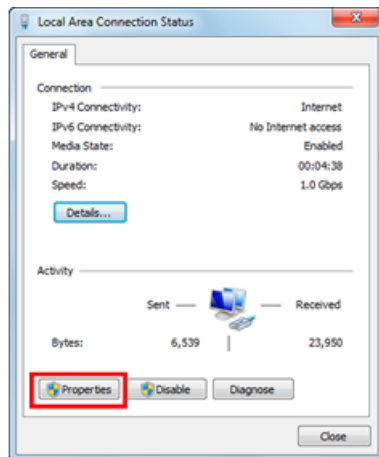


Click "Change Adapter Settings" to open.



Double click the LAN port connection used to control the cameras.

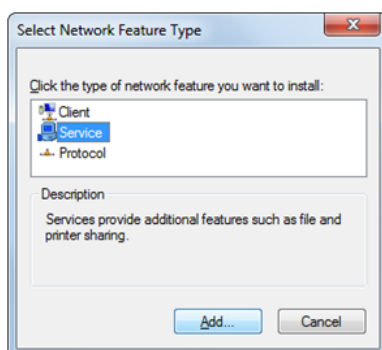
In general, select "Local Area Connection".



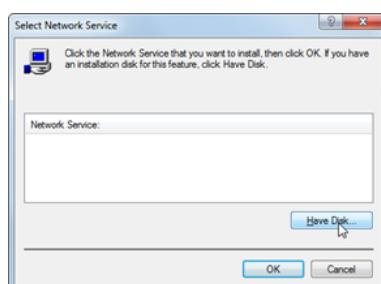
Click on "Properties" in the "Local Area Connection Status" window to open "Properties" in "Local Area Connections".



Click "Install" in the "Network" tab.

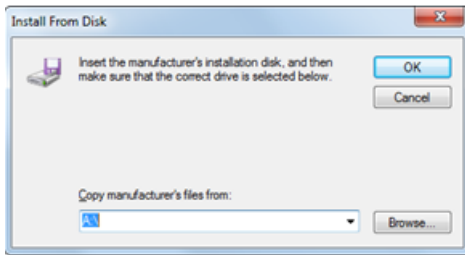


Select "Service" as the type of network function to be installed and click "Add".

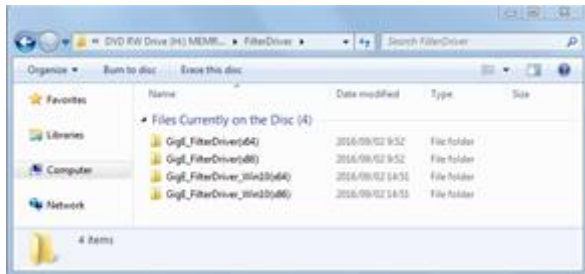


Click "Use Disc".

~Setup~



Click "Reference" to select the original copy of the file to be produced.



In the "Filter Driver" folder on the install CD, select the folder corresponding to the Windows used.

Windows 7/8/8.1 64bit version : GigE_FilterDriver(x64)

Windows 7/8/8.1 32bit version : GigE_FilterDriver(x86)

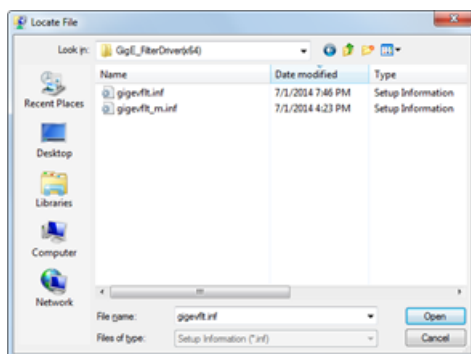
Windows 10 64bit version : GigE_FilterDriver_Win10(x64)

Windows 10 32bit version : GigE_FilterDriver_Win10(x86)

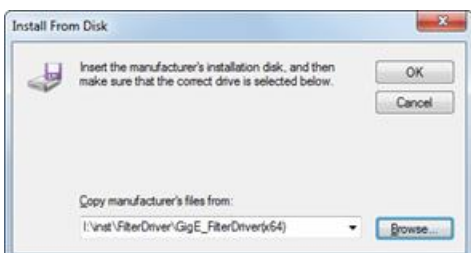


Caution

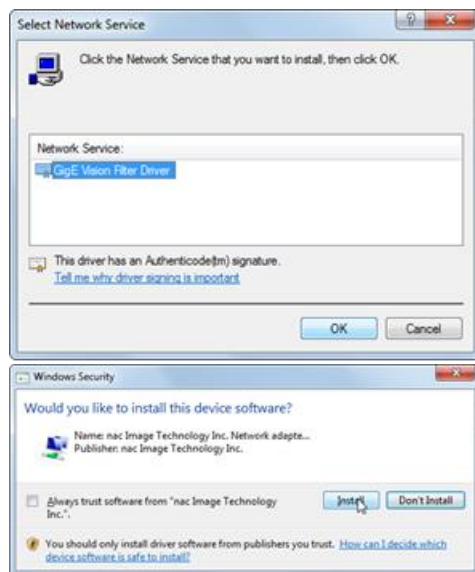
Confirm the type of Windows before installing the GigE Vision Filter Driver, and select the correct "Filter Driver". If a driver that is different from the type of Windows selected is installed, you may not be able to return to the beginning.



Select "gigevflt.inf" in the folder selected in "File Location" and click "Open".



Click "OK".

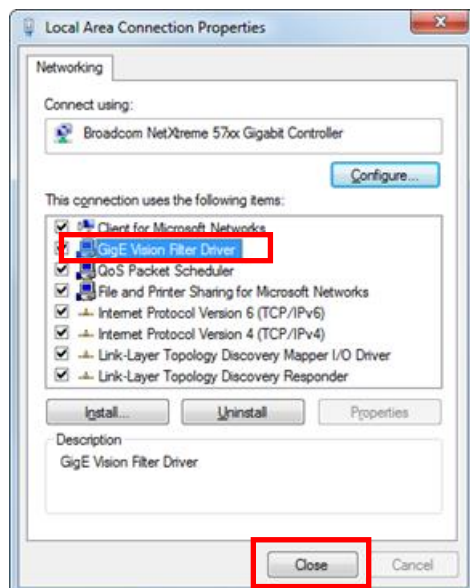


Select “GigE Vision Filter Driver” as the network service to be installed and click “OK”.

“Windows Security” may be shown several times.

Click “Install” each time.

The installation stops after several seconds.



Open Properties in Local Area Connections again and add “GigE Vision Filter Driver” and confirm that it is checked.

Click “Close”.

This completes the installation of the GigE Vision Filter Driver.

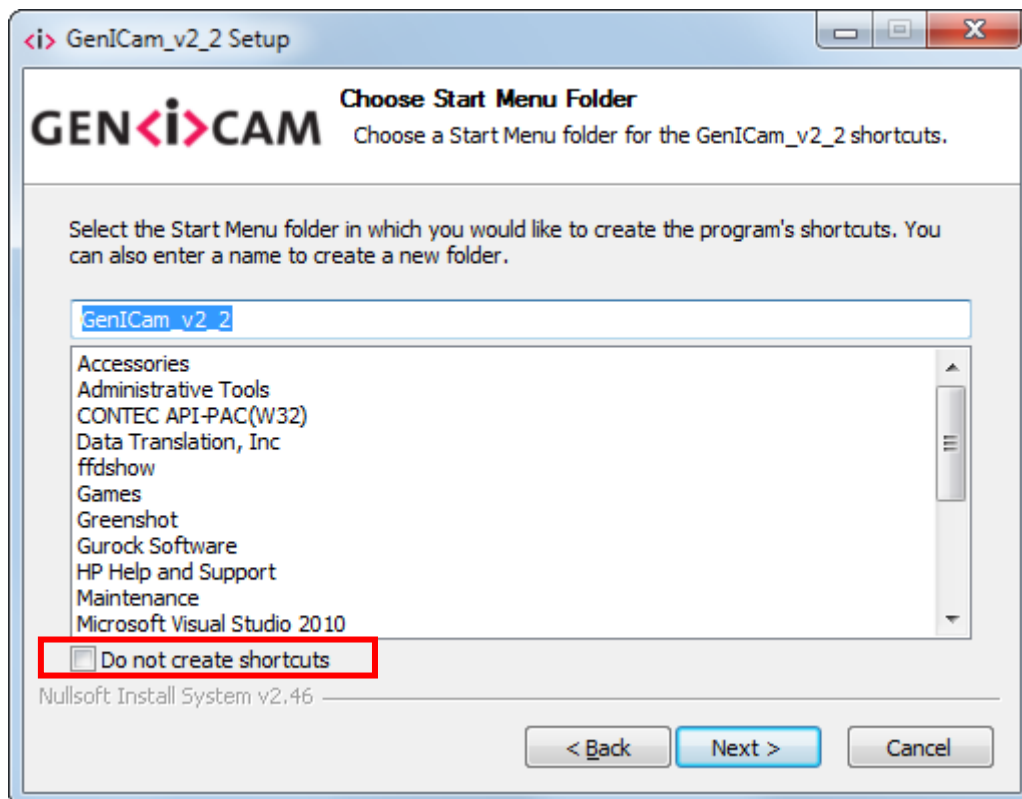
2.1.2 Install GenICam

Install GenICam if using the Q camera.

Select the installer corresponding to your Windows from the "GenICam" folder on the installation CD. Install GenICam 32bit (GenICam_VC80_Win32_i86_v2_2_0.exe) with a 32bit environment and install GenICam 64bit (GenICam_VC80_Win64_x64_v2_2_0.exe) with a 64bit environment. Special settings are not required during installation. Follow the Wizard to complete the GenICam installation.

Install with being checked "Do not create short cuts" off as shown by the figure below.

Q series cameras are not detected when it is checked on.



2.1.3 Install USB3.0 driver

When using USB 3.0 download with ACS camera, USB 3.0 driver must be installed.

Open the folder corresponding to your Windows from the "USB 3.0 Drivers" folder on the installation CD. (Example: Windows 10 64bit environment: USB 3.0 Drivers ¥ Win10 ¥ x64)

Please execute the installer in the folder, "DPinst32.exe" for 32bit environment, "DPinst64.exe" for 64bit environment. If you are asked to confirm user account control, click "Yes" and install according to the instructions of the wizard.

Click the "Finish" button to close the wizard.

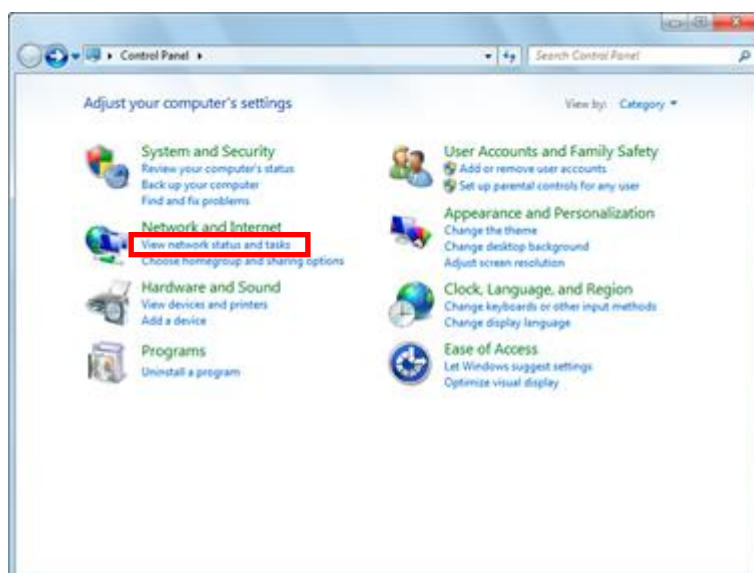
2.1.4 Install .NET Framework 4.7.1

".NET Framework version 4.7.1" or later must be installed for operating all function of MLink. If ".NET Framework version 4.7.1" or later is not installed on the Windows used, execute "NDP471-KB4033342-x86-x64-AllOS-ENU.exe" in the "MLink" folder on the installation CD to install.

To install ".NET Framework 4.7.1", the OS must be Windows 7 SP1 or later version.

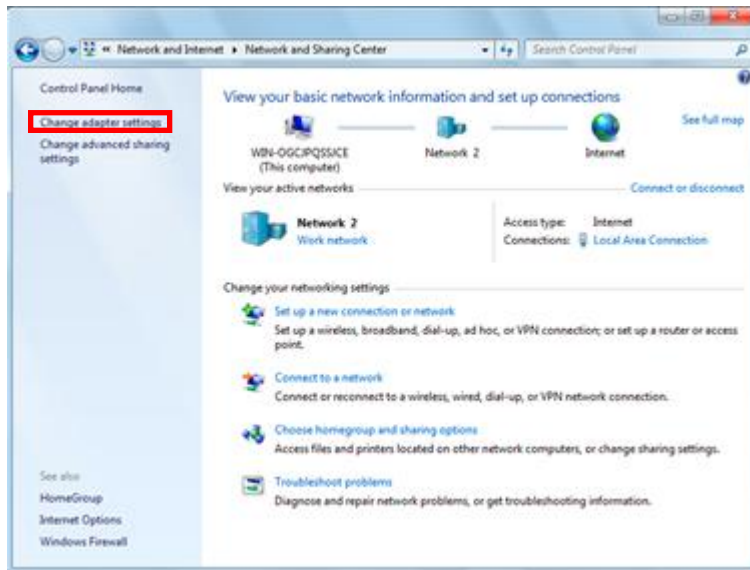
2.1.5 Setting IP Address on Installing PC

Open the control panel from the Windows start button.

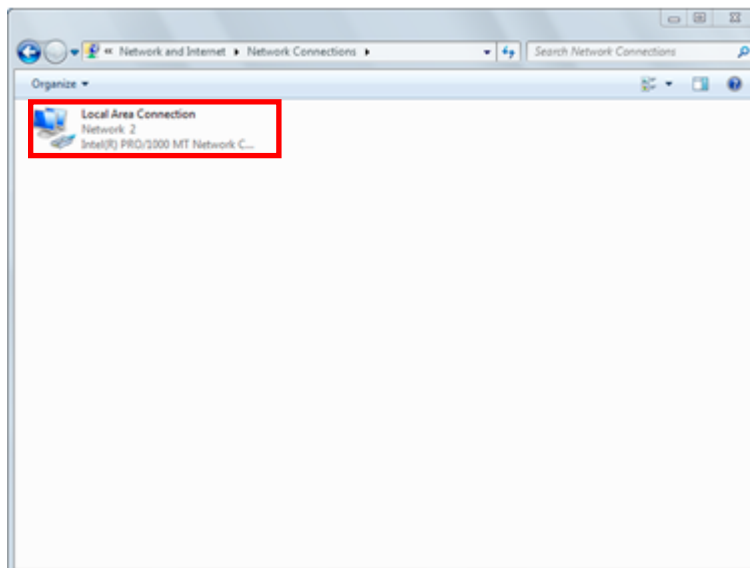


Click View network status and tasks.

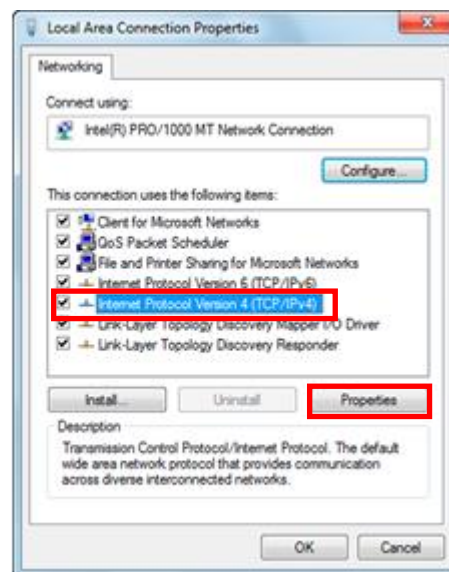
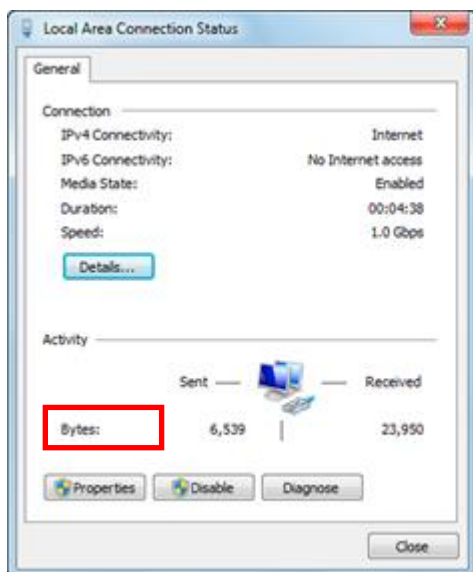
~Setup~



Click to open “Change adapter settings”.



Double click to open the LAN port connection used for HX camera control. Normally, select “Local Area Connection”. This manual describes an example where “Local Area Connection” was selected. If extending the LAN adapter for camera control, select the name of the connection for “Local Area Connection 2”.

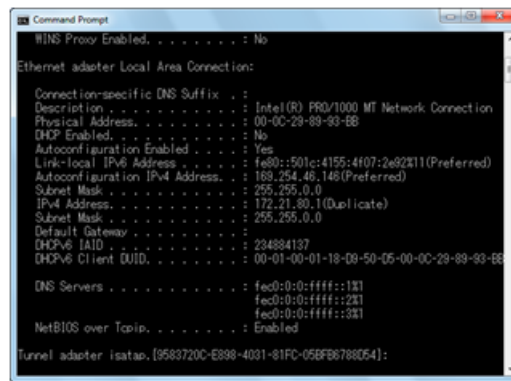


Click "Properties" in the "Local Area Connection Status" window to open the "Local Area Connection Properties" window.

Select "Internet Protocol Version 4 (TCP/IPv4)" in the items under the "This connection uses the following items" in "Local Area Connection Properties", and then click on "Properties" immediately under that to open the window for "Internet Protocol Version 4 (TCP/IPv4) Properties".



Set the PC IP address to 172.21.80.1 and the subnet mask to 255.255.0.0 as like the figure above. Click OK on the "Internet Protocol Version 4 (TCP/IPv4)", and then click OK on the "Local Area Connection Properties" to confirm the settings. Close the "Local Area Connection Status" window.



Confirm the IP address set for the PC by performing the ipconfig command with the command prompt. Open system tools from the Windows start button and click "Command Prompt" to open.

Type in ipconfig and press Enter to display the PC IP address. * If the PC IP address is set up other than 172.21.80.1, the PC IP address must be different from the camera IP address. At this point, communication is not possible if the PC and the camera not set the same Network segment and the Subnet mask on the same Network, and in this case, the Network segment is 172.21.*.* and the Subnet Mask is 255.255.0.0. For example, the subnet mask both of the PC and the camera is 255.255.0.0, and the PC IP address is 172.21.100.50, the camera IP address is 172.21.100.80. If the camera IP address is changed, refer to the camera user's manual.

2.2 Install MLink

Install MLink according to procedures (1) ~ (4) as follows.

1) Starting MLink Installer

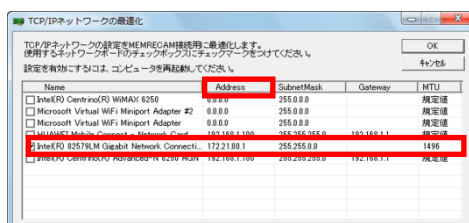
Double-click MLink_x86.msi for 32-bit version MLink, MLink_x64.msi for 64-bit version.

If the systems administrator confirmation screen is shown, click "OK".

2) Install

The MLink setup screen will appear. Proceed with the installation according to the Wizard.

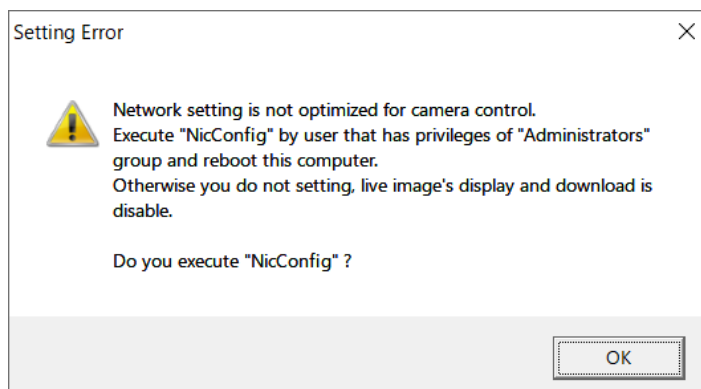
Execute "Optimize TCP IP Network" at the end of the MLink installation. Check the network board used for the camera connection and click "OK".



The "TCP IP network optimization" window displayed during the installation may be displayed behind other windows. In that case, switch the window with the task bar etc. to display the "TCP IP network optimization" window.

For your added information, when you don't optimize TCP/IP Network and execute camera exploring, following window is displayed.

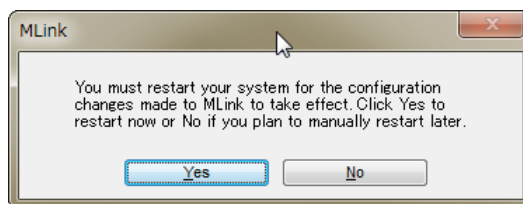
If you click "OK", "TCP/IP network optimization" is executed. Check the network board used for the camera connection and click "OK".



~Setup~

3) Restart

Restart the computer for the LAN settings for the camera to take effect.



4) Confirm Files Installed

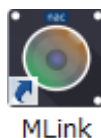
Check that the following shortcut is created on the desktop to indicate that the folder was created.

【Windows 64bit & MLink 32bit 】

: C:/Program Files (x86)/nac/MEMRECAM/MLink

【Windows 64bit & MLink 64bit / Windows 32bit & MLink 32bit】

: C:/Program Files/nac/MEMRECAM/MLink



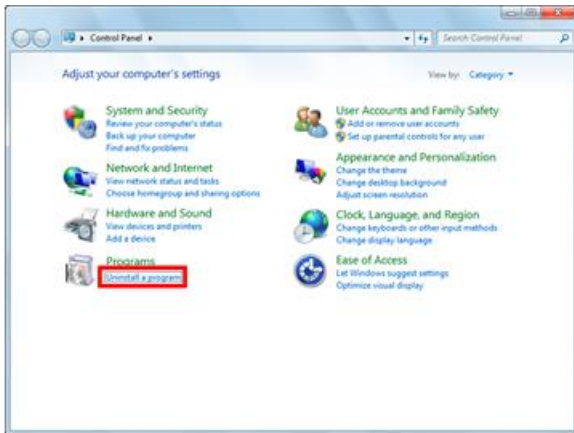
2.3 Uninstall

This describes the uninstall procedures if MLink is no longer needed.

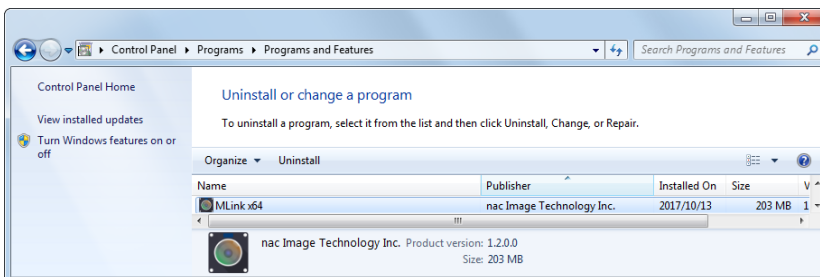
Even in MLink is uninstalled, the settings and data saved with MLink are not deleted.

2.3.1 Uninstall MLink

Open the "Control Panel" and click "Uninstall Programs".

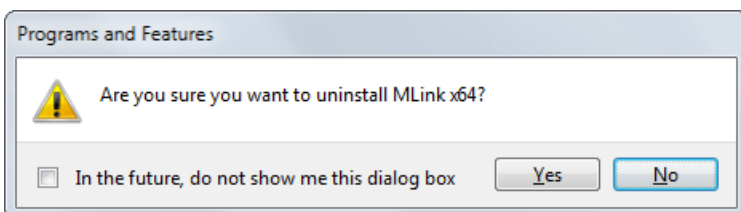


Select "MLink" from the list of programs and double click.



Click "Yes" when the screen to confirm uninstalling MLink appears.

Click "Yes" when the "User Account Control" screen appears to uninstall.



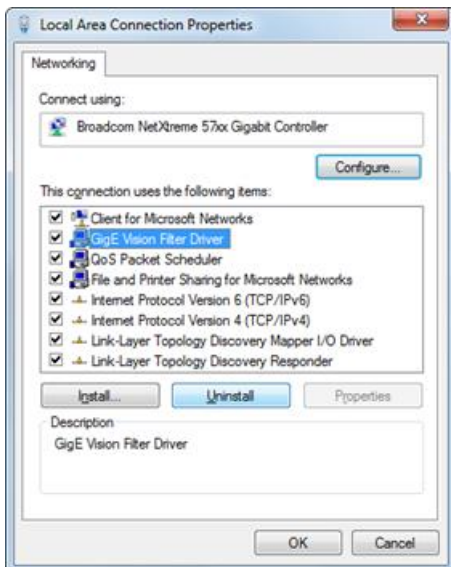
It takes several seconds to uninstall MLink.

"MLink" disappears from the list of programs when the uninstallation is complete.

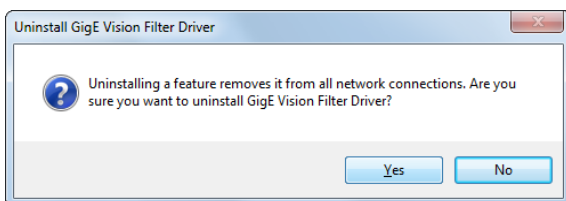
This completes the MLink uninstallation.

2.3.2 Uninstall the GigE Vision Filter Driver

Open "Properties" in Local Area Connections".



Select "GigE Vision Filter Driver" and click "Delete".



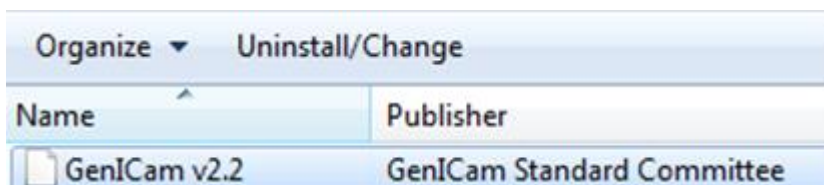
Click "Yes".

This completes the uninstallation of the GigE Vision Filter Driver.

2.3.3 Uninstall GenICam

Open the "Control Panel" and click "Uninstall Programs".

Select "GenICam v2.2" from the list of programs and double click.



This completes the uninstallation of the GenICam.

2.3.4 Uninstall USB3.0 driver

Turn on the ACS camera and connect the ACS and the PC with the USB 3.0 cable.

Open the "Device Manager" on the PC.

(In Windows 10, press and hold [Start] button (or right click) and select [Device Manager].)

Right click "Cypress FX 3 USB Streamer Example Device".

Click "Delete" from the displayed menu.

Please check "Delete driver software of this device" and click "OK".

This concludes uninstallation of the USB 3.0 driver.

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3

Quick Start Tutorial

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3 Quick Start Tutorial

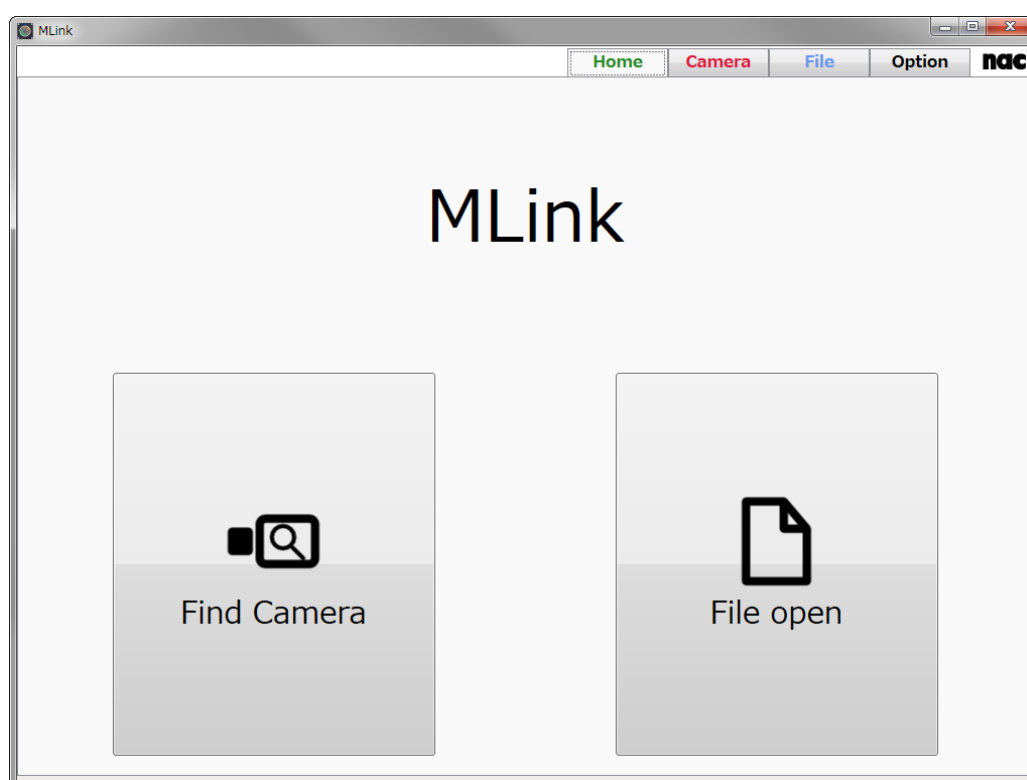
This tutorial describes the general operating procedures for MLink.

3.1 Startup MLink

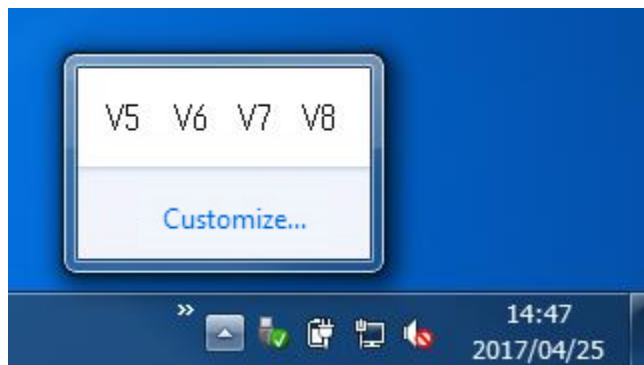
Double click on the shortcut icon on the desktop or on MLinkMainWindow.exe in the installed folder to start MLink.



Once it is started up, the following main window appears.



Also, the following icon appears on the notification area of the task bar.



These icons refer to the helper module to perform communication control with the MEMRECAM camera. Do not end this during MLink startup. When MLink ends, these helper modules also end simultaneously.

3.2 Camera Control

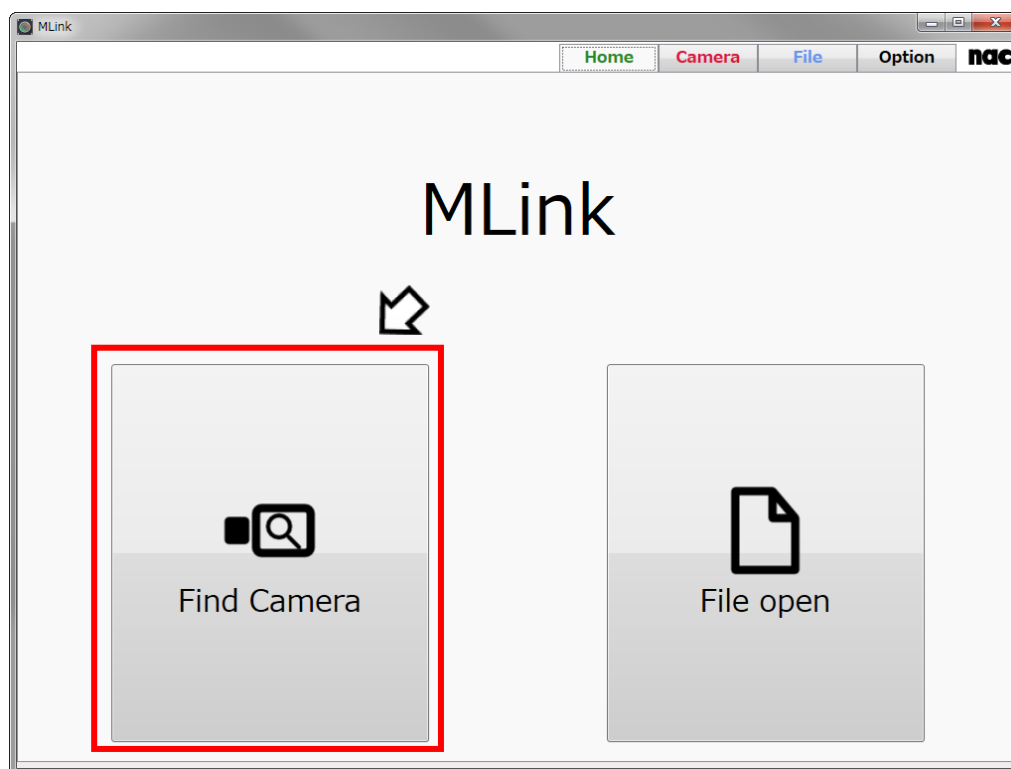
Explanations for connecting to cameras, recording, adjusting the quality of recorded images and the downloading method are provided.

3.2.1 Connect the Camera

Perform the following procedures for the camera connections.

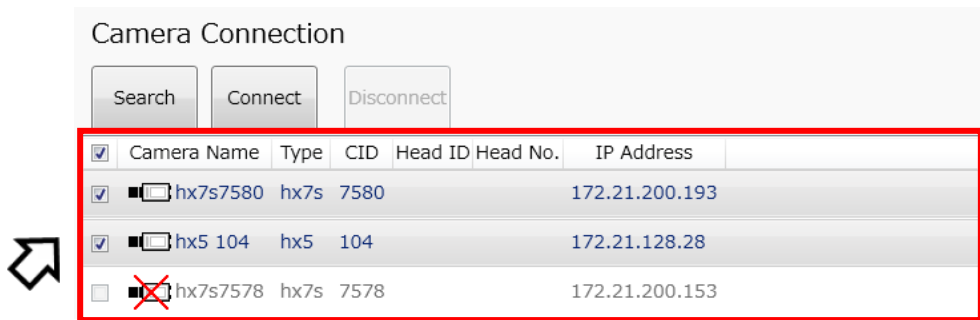
- 1) Select "Find Camera" on the home screen.

Select either perform camera control or perform file operation on the home screen.



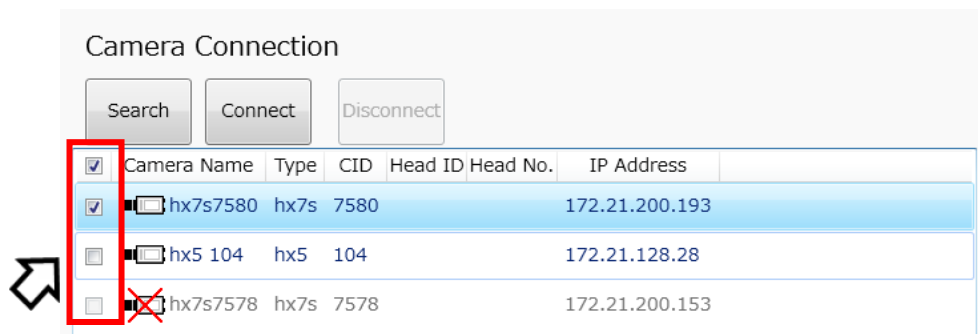
- 2) Once the cameras on the same network are found, they are shown in a list.
Cameras that can be connected are shown on the top of the list, with a box checked on the left side of the list.
A red X mark is placed before the nickname of the cameras in the "Cameras Used by Other PC".

If a camera that is not connected is checked, click on the box for that camera to eliminate that checkmark.

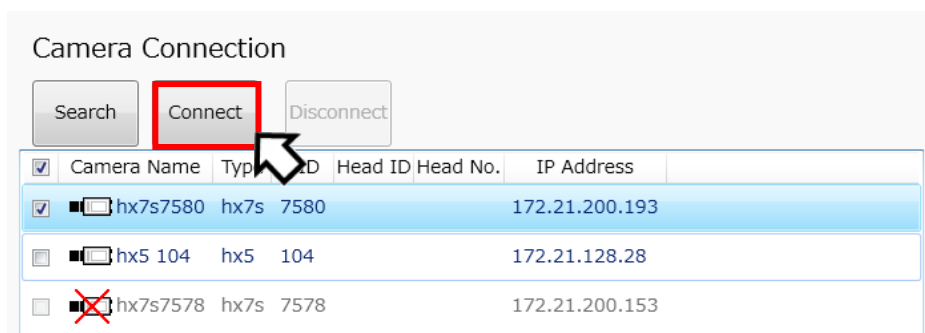


3) Select a camera From the List

If a camera that is not connected is checked, click on the box for that camera to eliminate that checkmark. You can select / deselect all cameras in the check boxes in the title line.



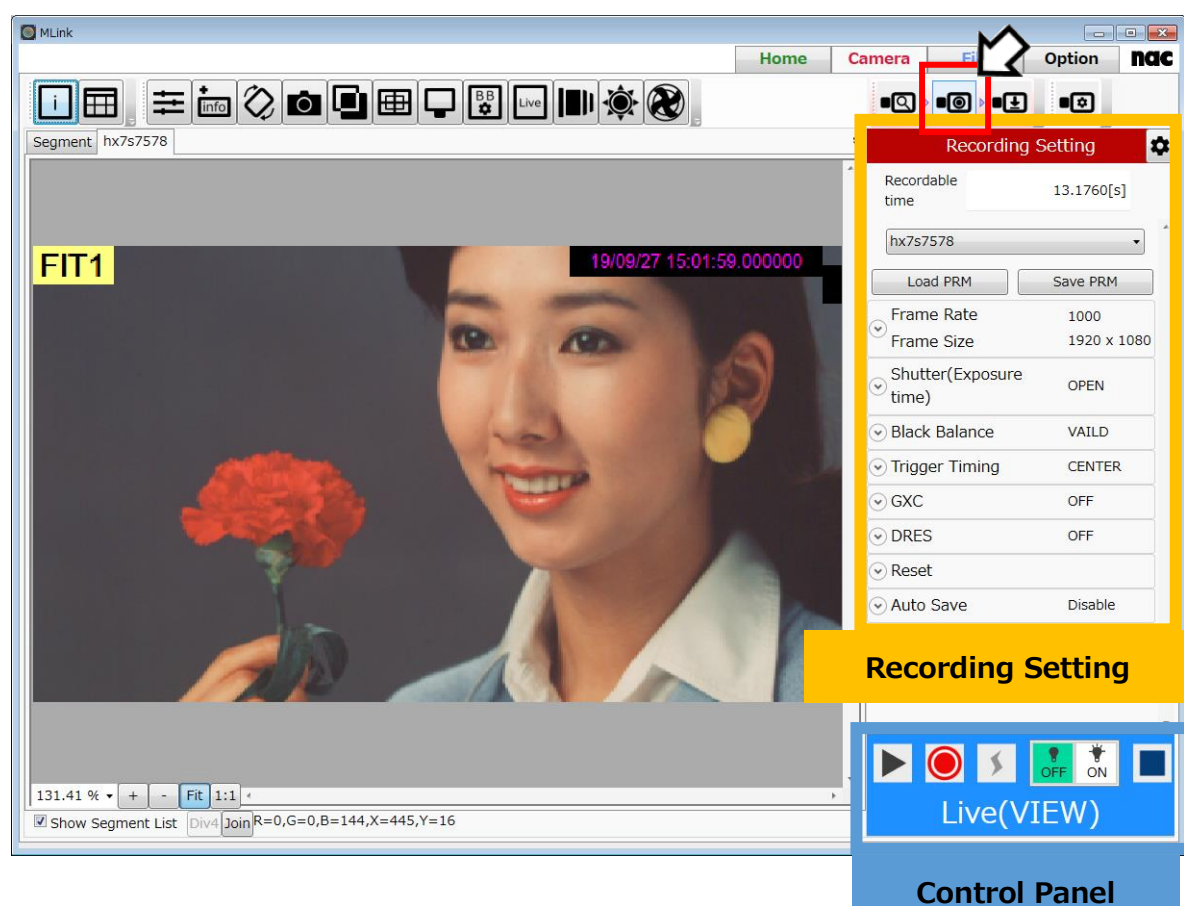
4) Click "Connect" to connect to the camera.



3.2.2 Recording with the Camera

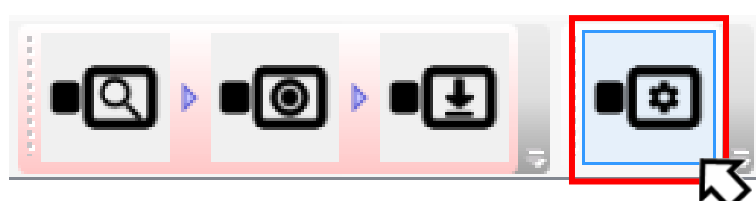
Once connected to the camera, it automatically switches to the recording screen. The camera automatically switches to VIEW and the live image appears. (Camera mode after connection can be set other than live. Refer to ⇒ p.279)


The recording settings, including the frame rate and resolution, as well as recording are conducted on the recording screen.



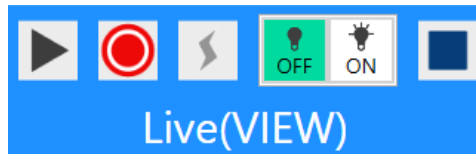
Settings such as the frame rate are performed from the recording settings panel (refer to ⇒ p.61). Control the camera and film from the control panel (refer to ⇒p.73). Divide displayed live image size and display side by side from status bar as with files (refer to ⇒p.299).


Set the method of camera operation with the "Photographing Menu" when first using the camera or when changing the recording method. (refer to ⇒p.95)



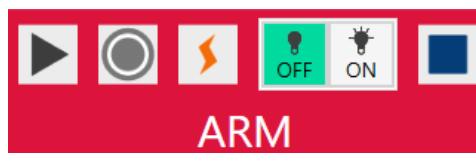
After clicking View  on the camera, you can change the settings while reviewing the image.


When the camera is in the View mode, the control panel turns blue.



After making the settings, click  to access the standby state and then record with the trigger input.

When the camera is in the recording (standby) mode, the control panel turns red.



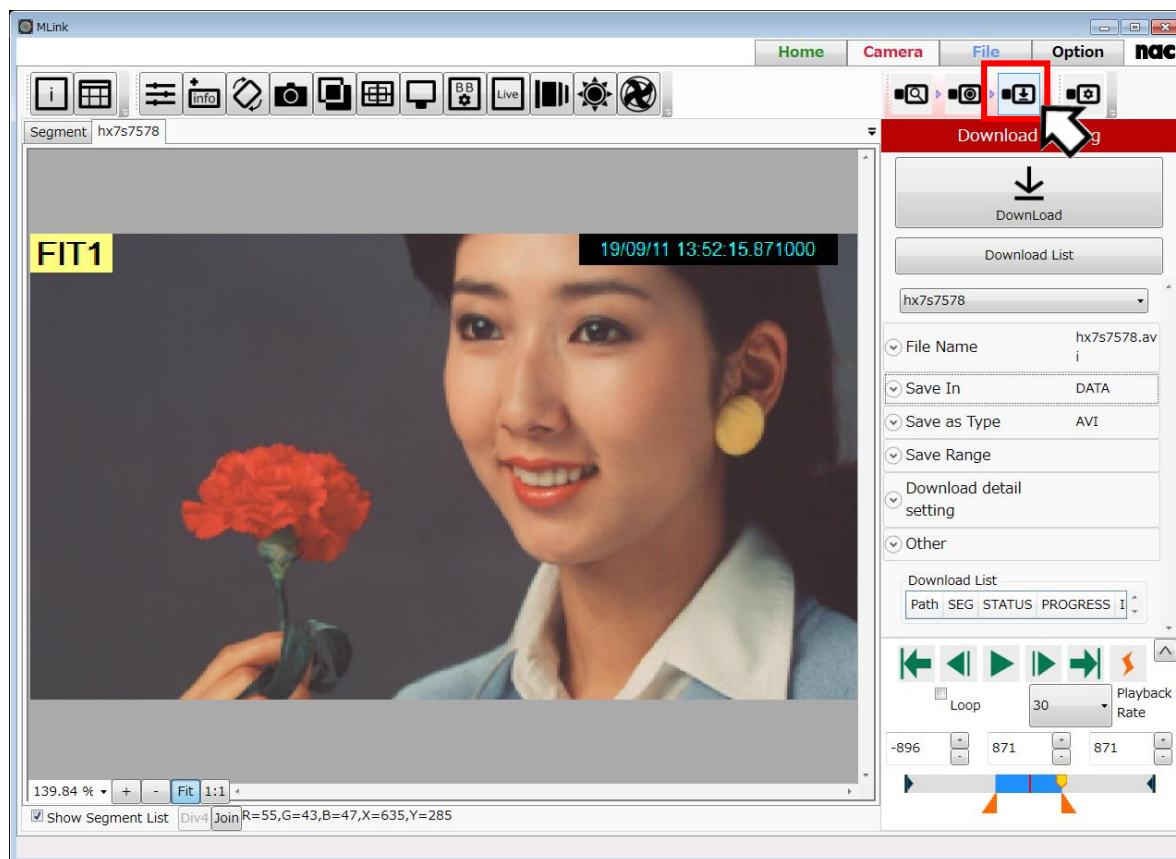
If the camera is stopped, click  to access the recording (standby) mode without viewing.

(refer to ⇒p.73)

3.2.3 Playback and Adjust the Image Quality of the Images Filmed

After recording has finished, it automatically switches to the download screen. Select "Download" from the camera task tool bar to switch to the download screen.

Playback the recorded images on the download screen to check and adjust the image quality.



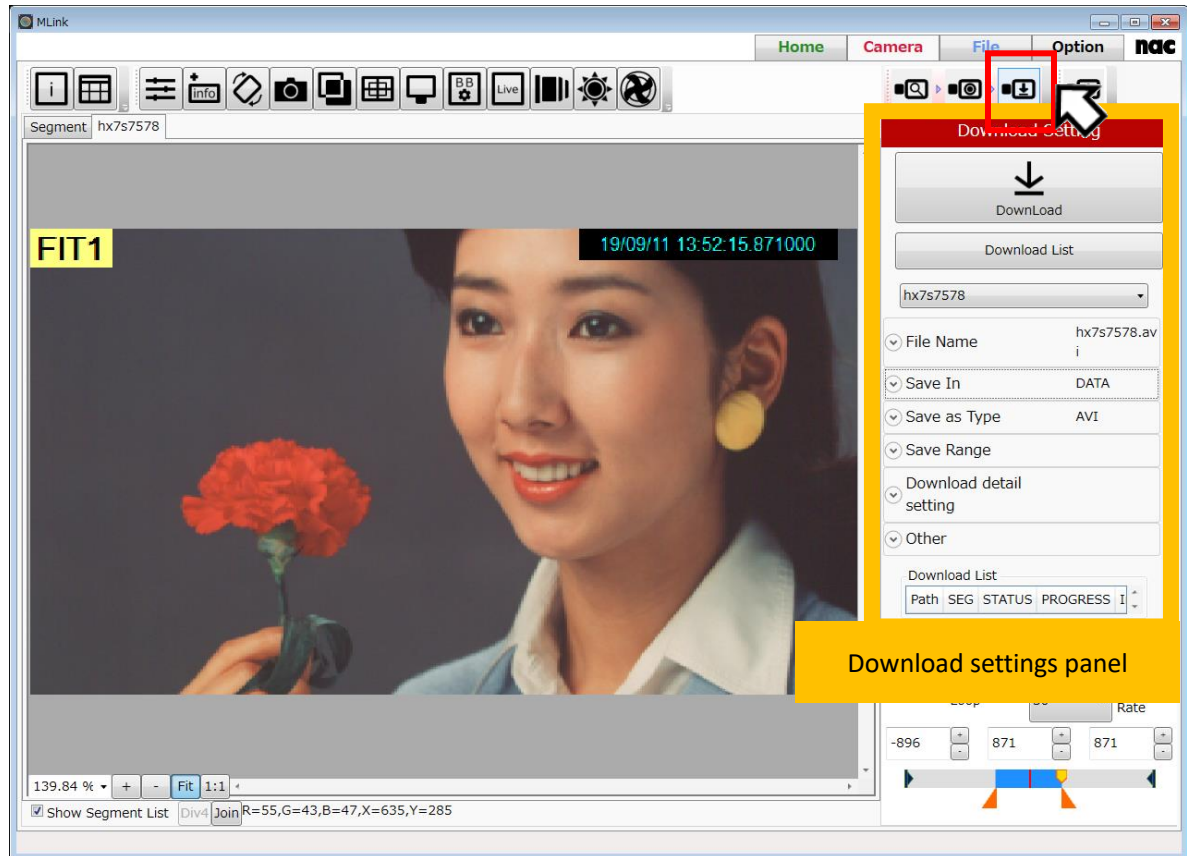
Adjust the image quality for white balance and such from the adjust image quality panel (refer to ⇒p.128).

Set the playback range from the control panel (refer to ⇒p.75) and play back the recorded images.

3.2.4 Download Images

Review the playback images and check the range for the data download.

Download the recorded images from the specified range to the PC.



Download according to the following procedures.

- 1) Input the name of the file to be saved.

The default is "camera model + camera ID".

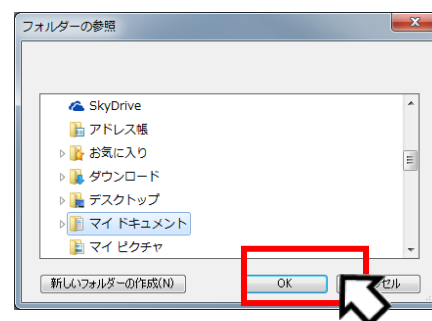
| | |
|---------------------------------------|----------|
| File Name | hx1 7540 |
| <input type="text" value="hx1 7540"/> | |

- 2) Click on the save to "...".

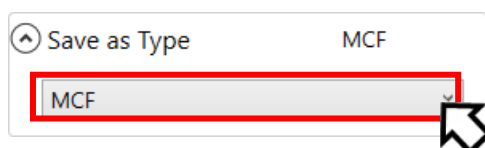
Or manually input the destination.

| | |
|---|---------|
| Save In | Desktop |
| C:\Users\nacswg\Desktop | |
| <input type="button" value="Brows for Folder"/> | |

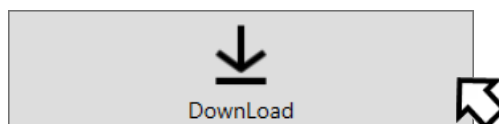
The “reference folder” screen on the right appears, so select the destination for saving the image file and then click “OK”.



3) Set the save format for the downloaded image file.

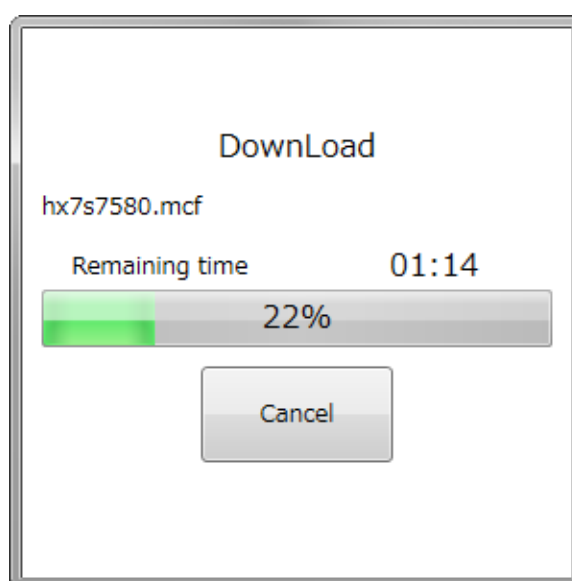


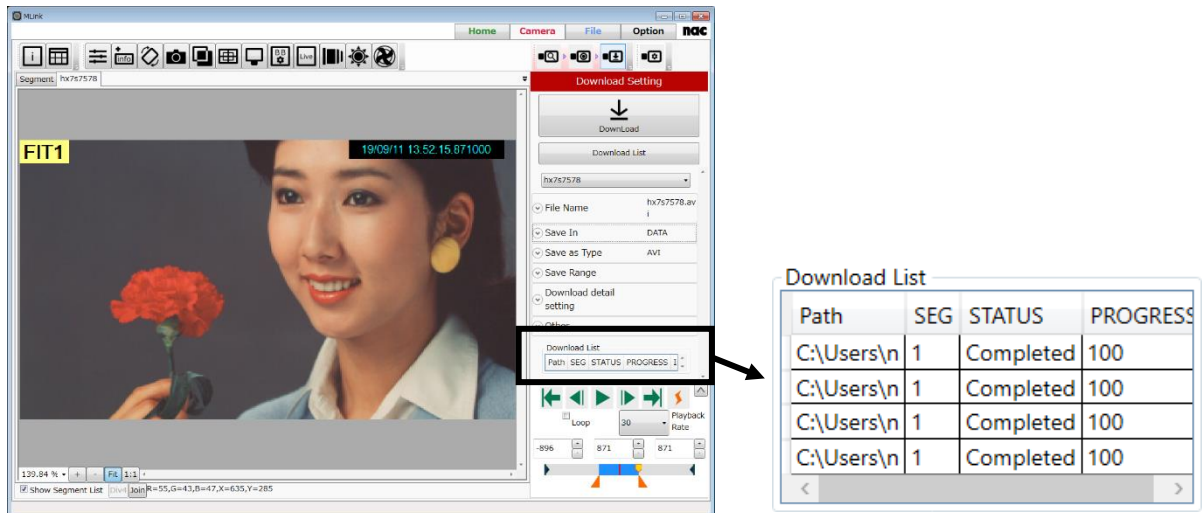
4) Click “Start Download” to start downloading.



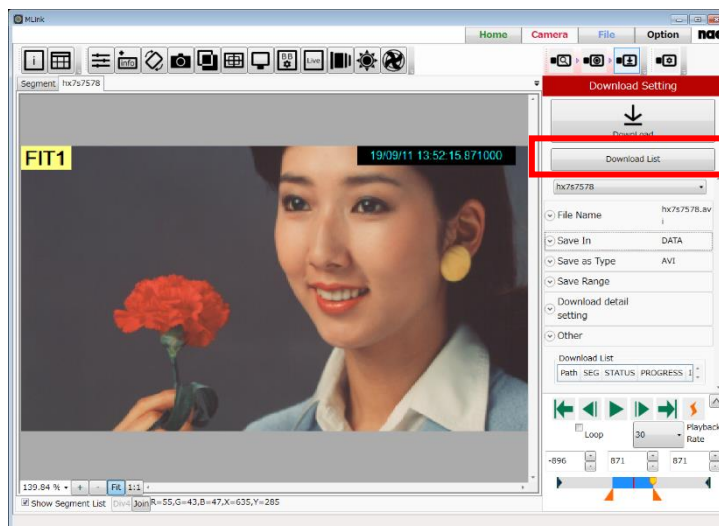
If the “File Name” and “Destination” are not input, you will not be able to click on “Start Download”.

5) Once downloading starts, the progress bar appears and the progress of the download is shown.





Once the progress bar reaches 100%, the STATUS on the list shown will be “Completed” and the download will be completed.



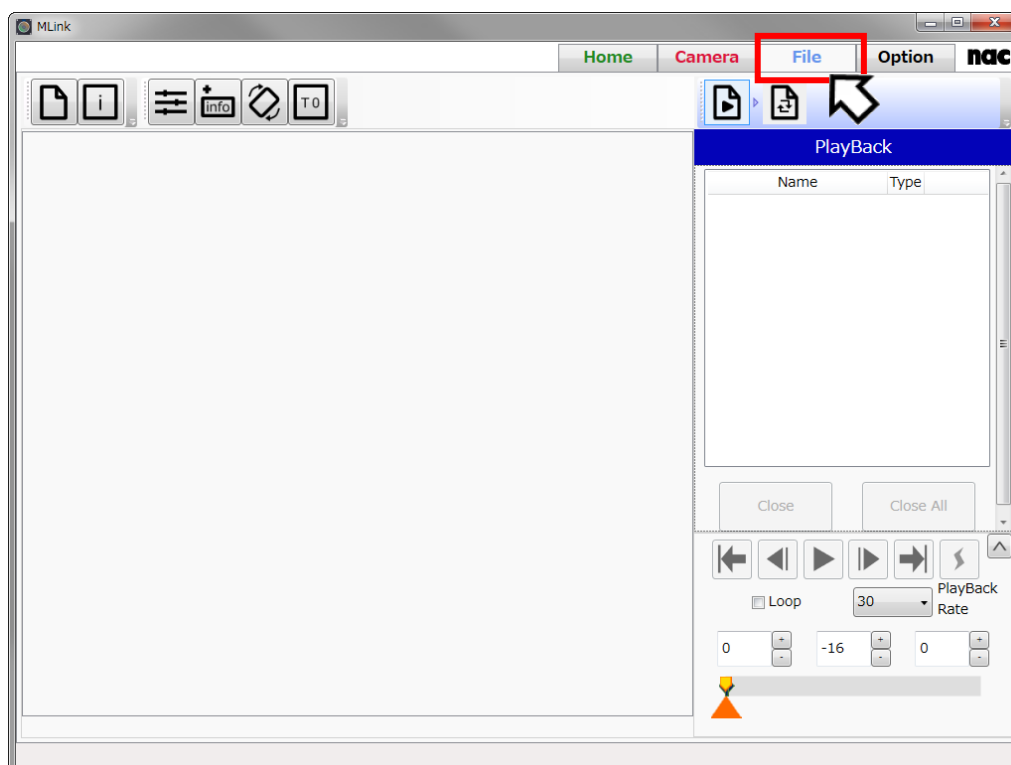
When two or more cameras are connected, you can set the download all together by selecting the download list. (refer to ⇒p.91).

3.3 File Playback

This provides a description for opening the multiple image files filmed, as well as the methods for playback, image quality adjustment and format conversion.

Select "File" from the mode tab to work with the file.

Select "File" and the follow screen appears.



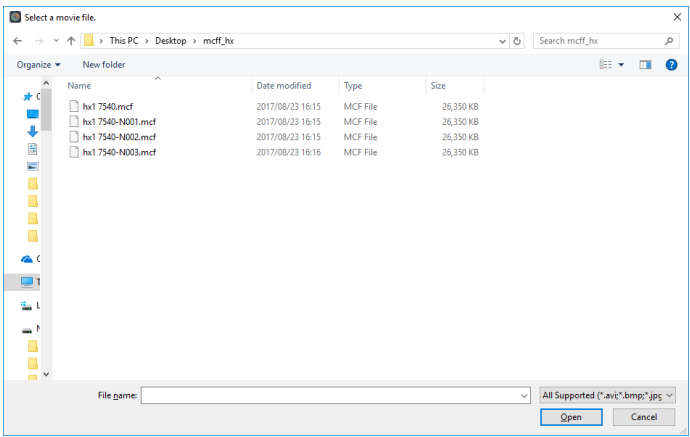
3.3.1 Open Files

Open files according to the following procedures.

- 1) Click "Open" on the file quick tool bar.

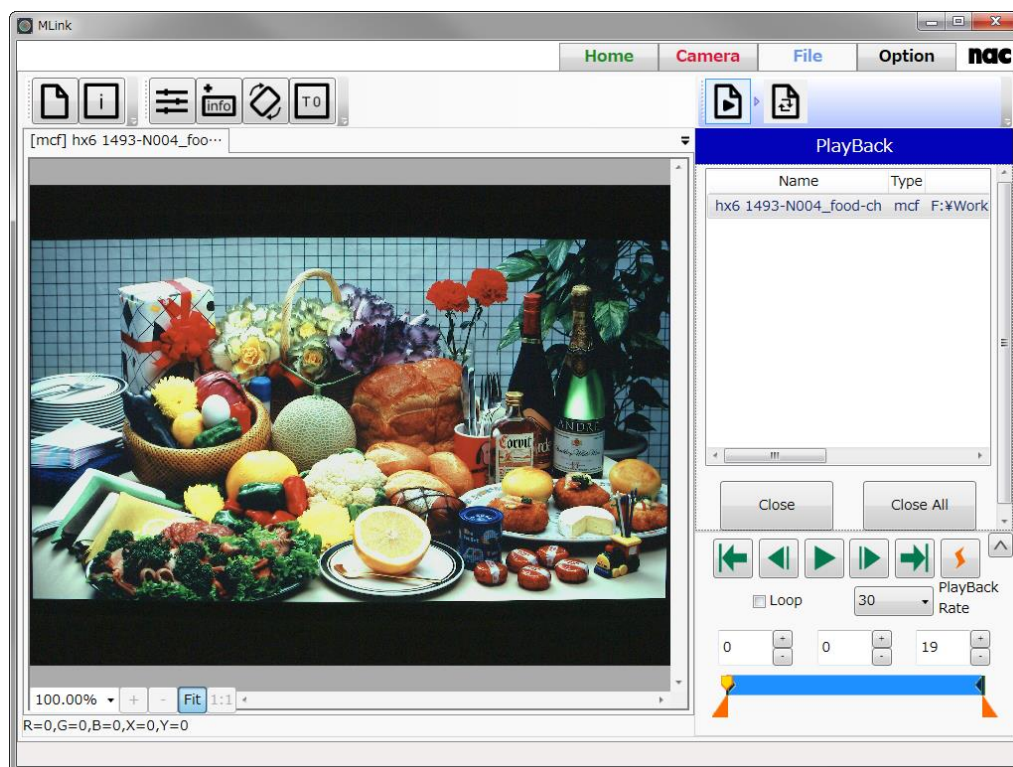


2) The following file selection screen appears so select the image file and click “Open”.

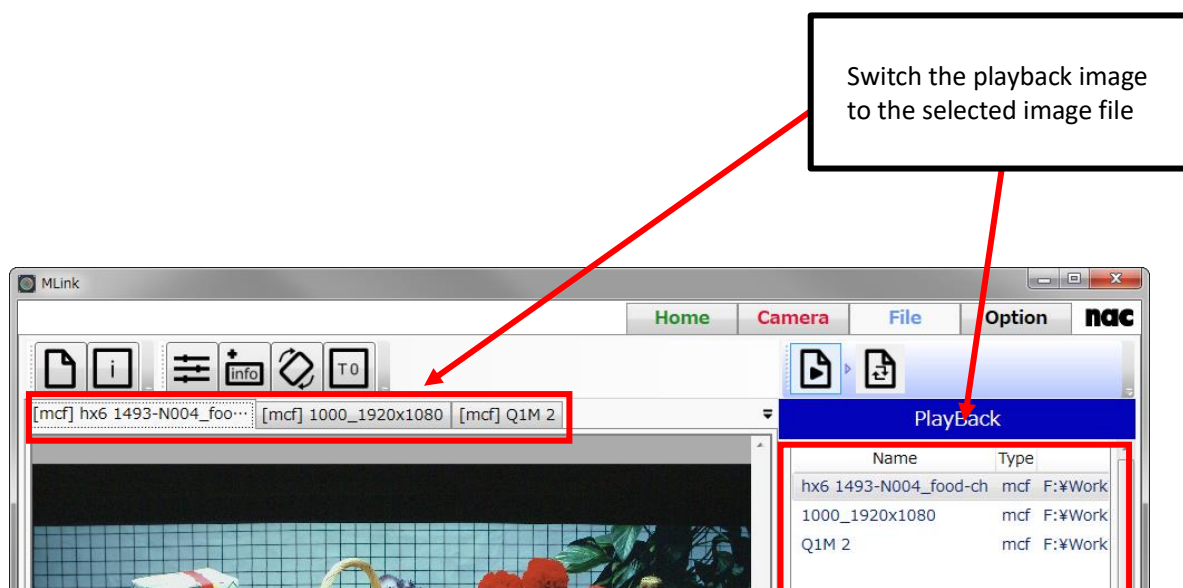


3.3.2 Play Files

Set the image to be played back and the playback range from the control panel.



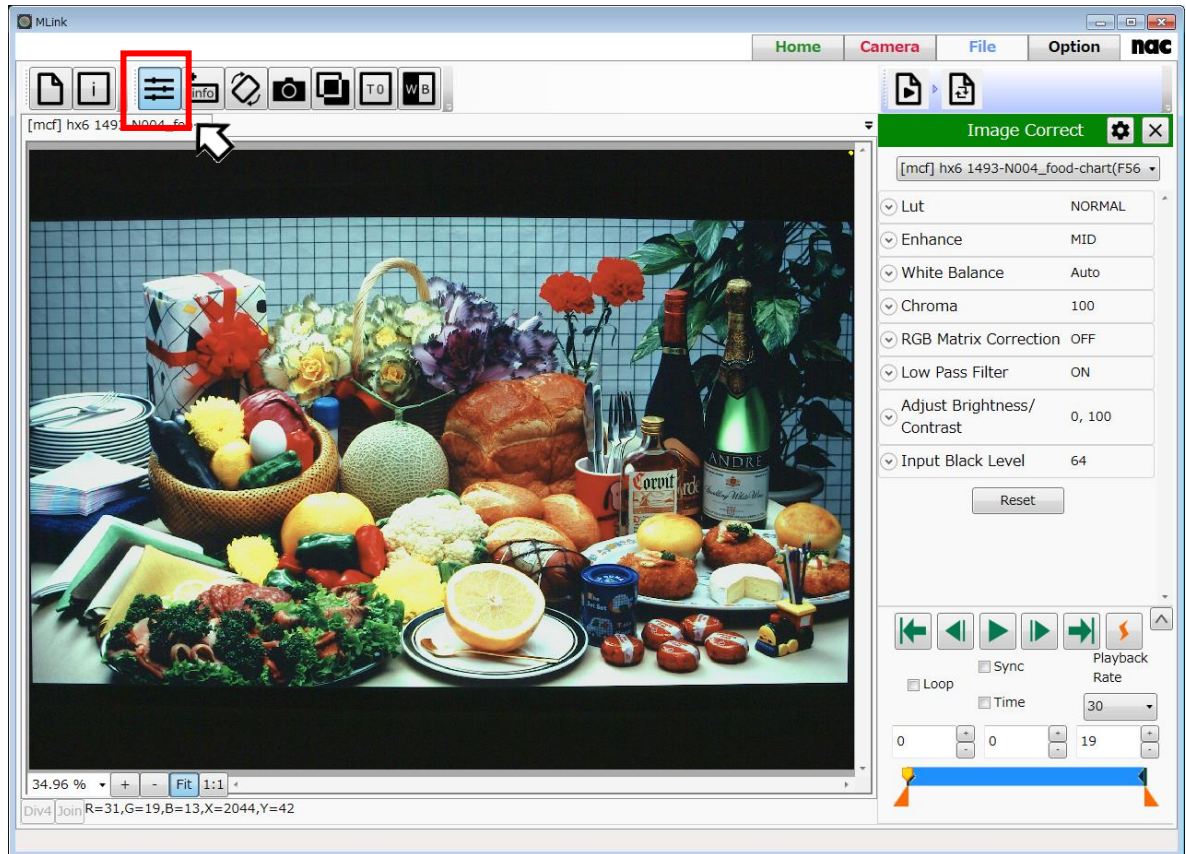
If opening multiple image files, select the image file from the list and switch the image file to be played. You can switch the image files from the monitor tab.



3.3.3 Adjust the Image Quality

Select "Adjust Image Quality" from the file quick tool bar and the image quality adjustment screen appears.

Adjust the image quality of the file on the image quality adjustment screen.

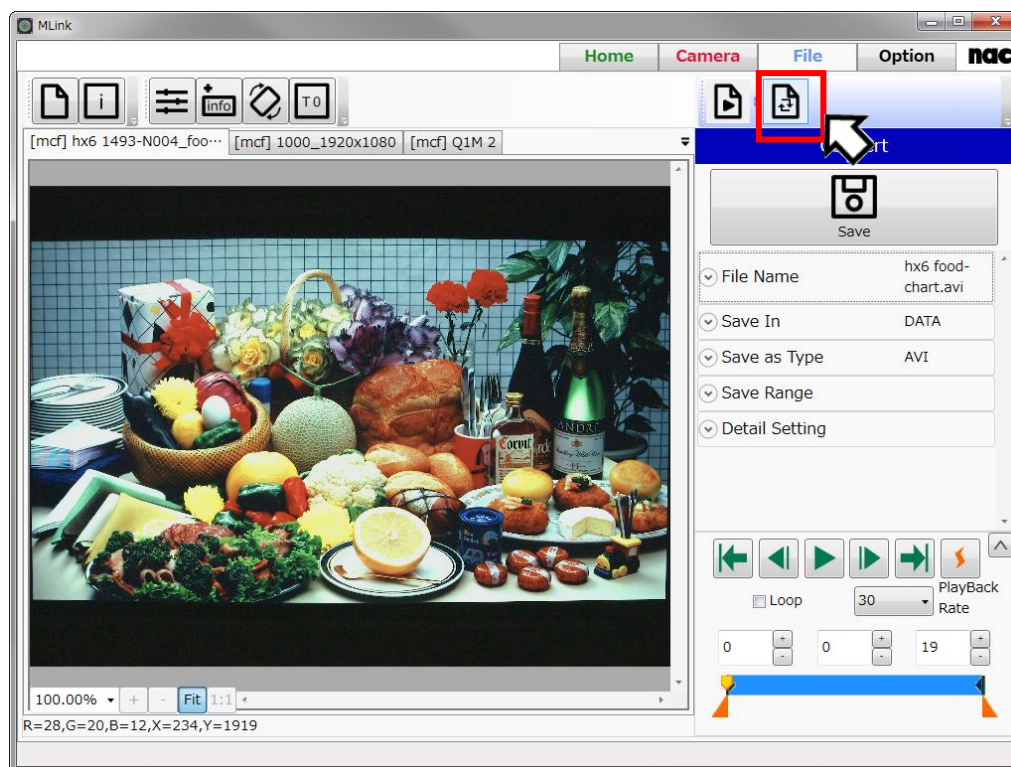


Use the image quality adjustment panel (refer to ⇒p.128) to perform image quality adjustments such as white balance.

3.3.4 Convert Formats

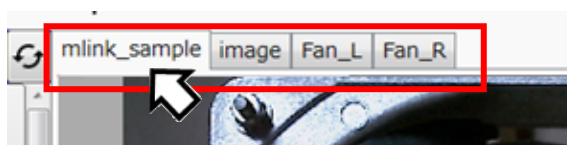
Select "Convert" from the file task tool bar and the format conversion screen appears.

Use the format conversion screen to convert the image quality adjusted image from the original format and save on the PC.



Use the following procedure for format conversion.

- 1) Select the MCF file that will be subject to format conversion from the tab.



Only MCF files can be subject to format conversion

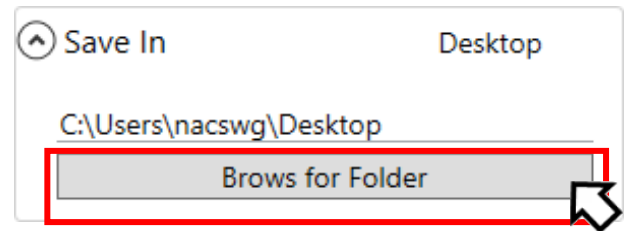
- 2) Input the name of the file to be saved.

The default is to input the original file name.

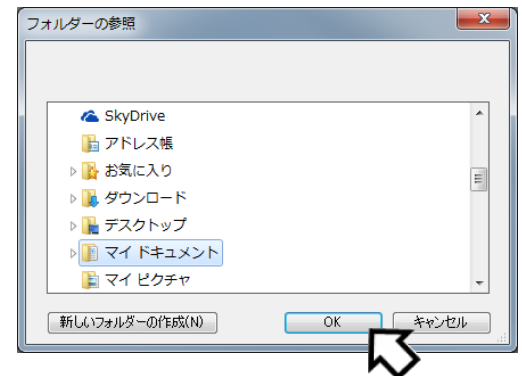


3) Set the destination folder for saving.

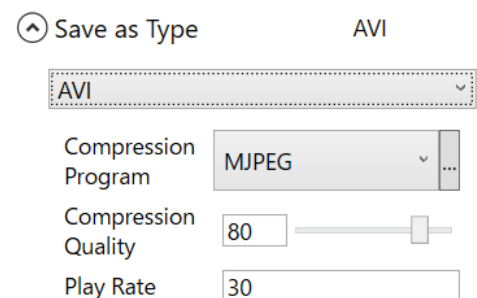
Click "Browse for Folder" for the destination.



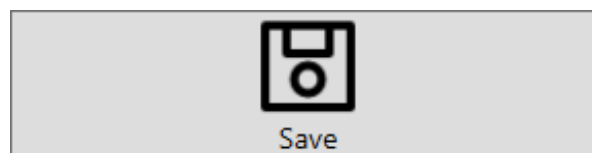
The "reference folder" screen on the right appears, so select the destination for saving the image file and then click "OK".



4) Set the save format after format conversion.



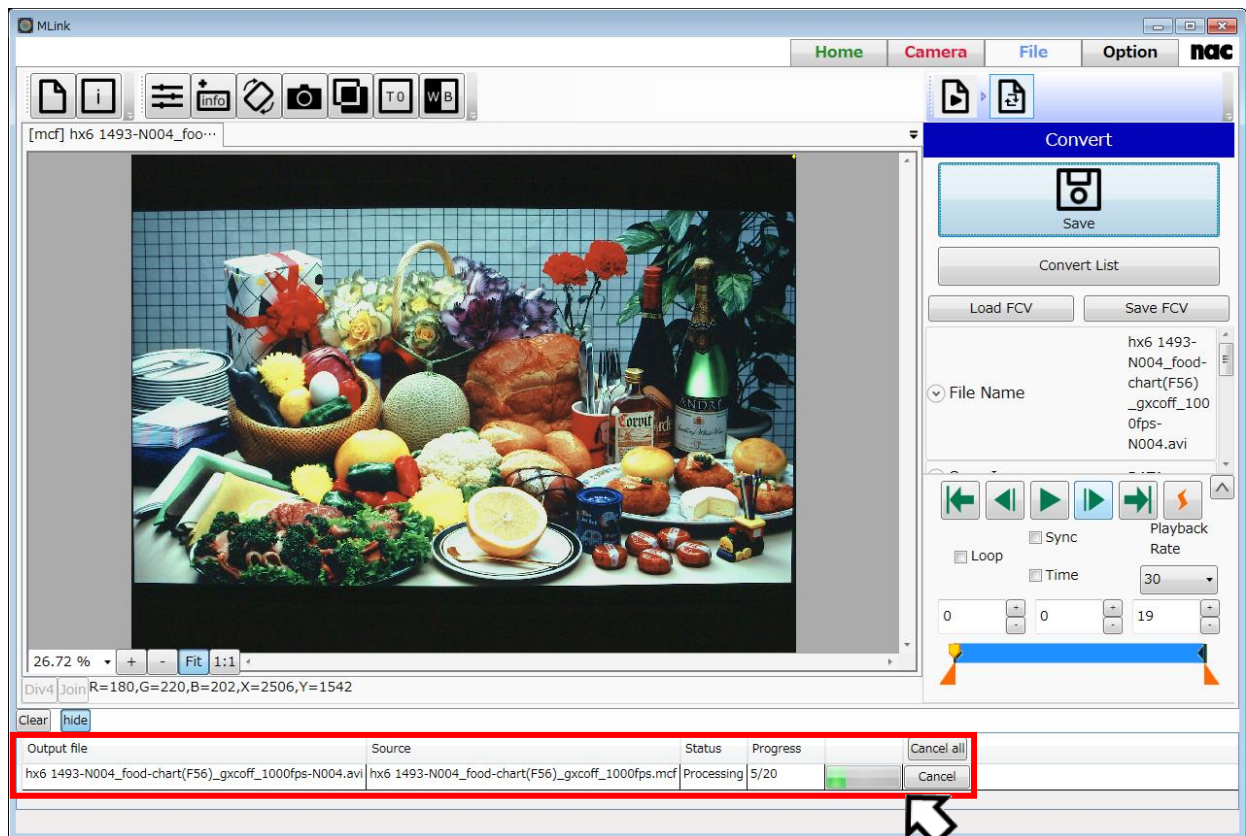
5) Click "Start Conversion" to start converting the format.



If the "File Name", "Destination" and "Save Format" are not input, you will not be able to click on "Save Conversion".

Once saving the conversion starts, the conversion list appears at the bottom of the work space and the conversion task is added. The progress bar appears and the progress of the conversion task is shown.

After the conversion, you can hide the progress bar by clicking "hide" button. Also you can show the progress bar by clicking "Display convert progress" button that exists in detail settings in convert setting panel.

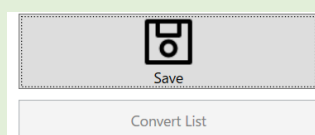


Format conversion is performed in the background, and after conversion, the files are saved to the destination specified, under the file name specified. Also the file is opened automatically by clicking "Open the file, after the convert" button that exists in detail settings in convert setting panel.

Cameras can be controlled during format conversion.

There is no need to wait until after the conversion is completed to work with MLink.

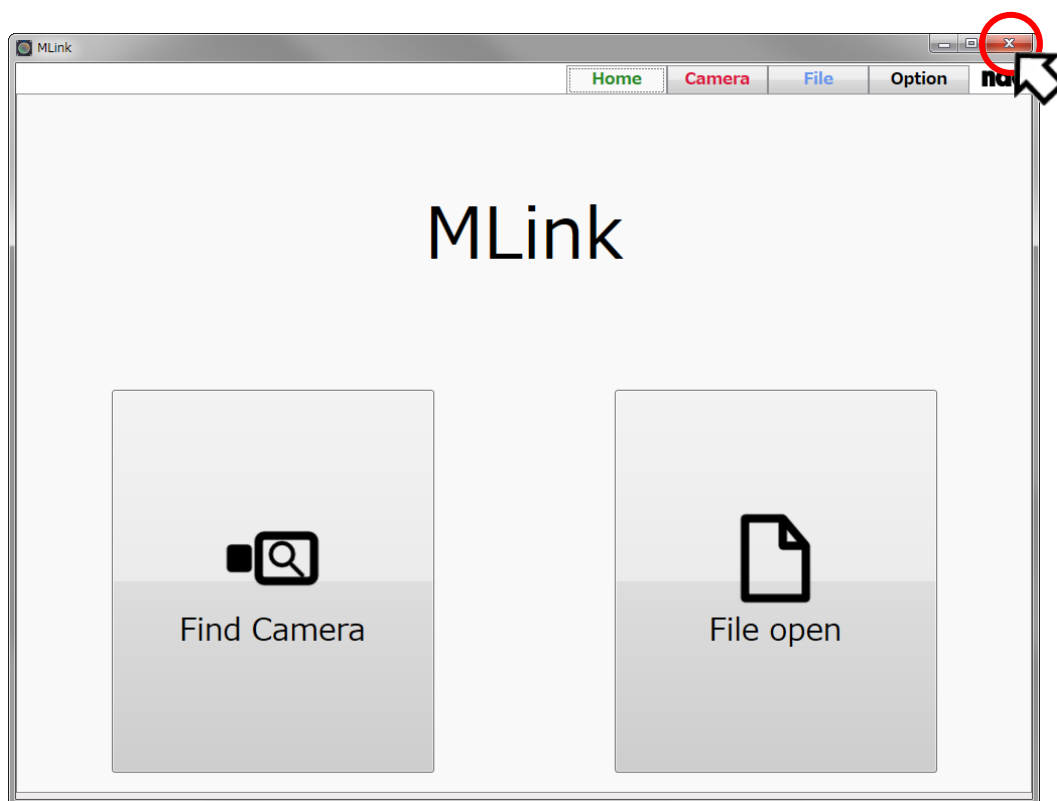
During the format conversion, you cannot click the "Convert List" button.



- 6) Format conversion is complete when "Complete" is shown in the status area for conversion tasks.

3.4 End MLink

Click the X in the top right corner of the main window to end MLink.



4

References for the Functions

]

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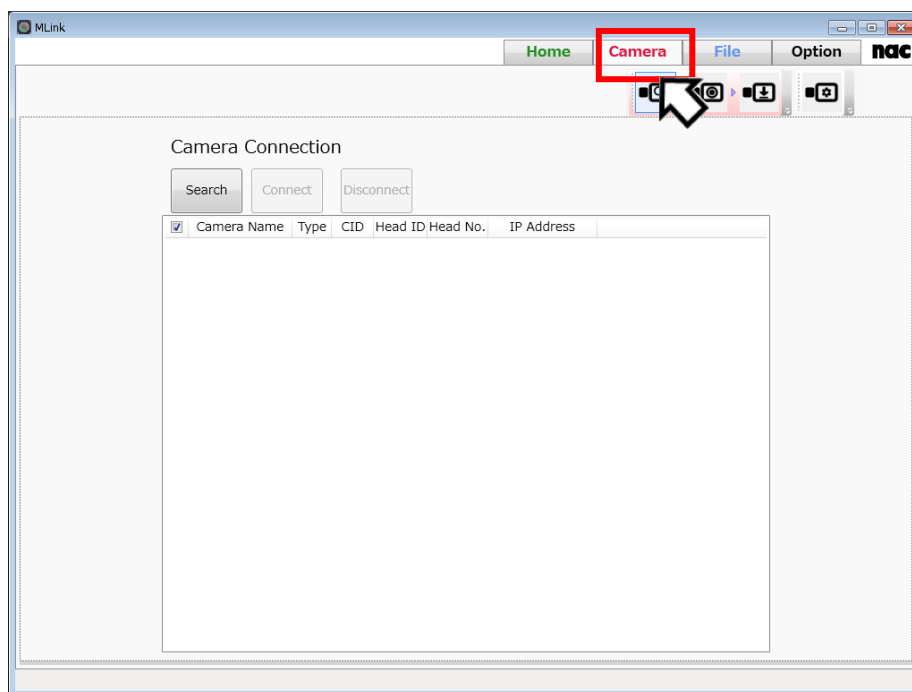
4 Function Reference

References for each function installed on MLink.

4.1 Camera Control

Camera control is performed with the camera tab.

Select "Camera" from the mode tab and the camera tab screen appears.



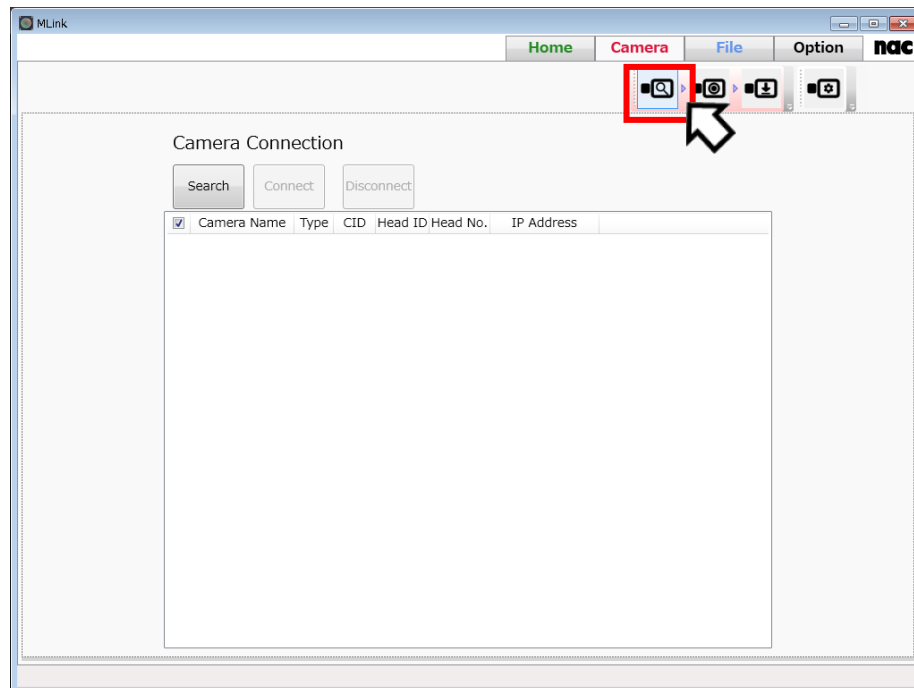
Each task on the camera task tool bar is performed as follows.

- 4.1.1 Connect Cameras (refer to ⇒p.56)
Search for cameras on the same network and connect the camera selected.
- 4.1.2 Record (refer to ⇒p.60)
Settings for recording in order to record.
- 4.1.3 Play and Download (refer to ⇒p.75)
Playback the recorded image to review. Determine the range and download.
- 4.1.4 Photographing Menu (refer to ⇒p.95)
Settings determining the photographic environment.
Application settings determine the filming environment and don't have to be set for recording each time. Set if necessary. You can also review the current camera settings.

4.1.1 Connect Camera

Select "Connect" from the camera task tool bar and the connect camera screen appears.

Operations for camera searches, connections and disconnections are performed on the connect camera screen.

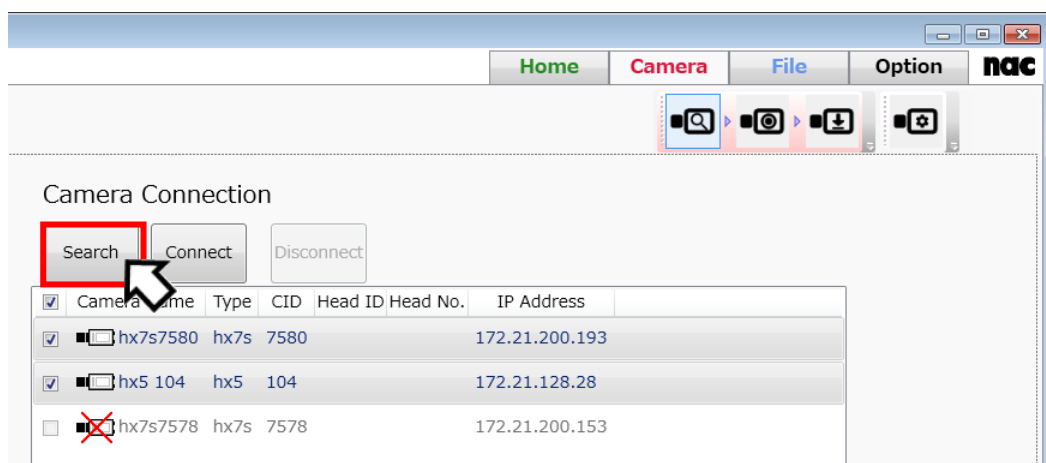


"Connect Camera" Screen

Camera Search

Click "Search" to search for cameras on the same network.

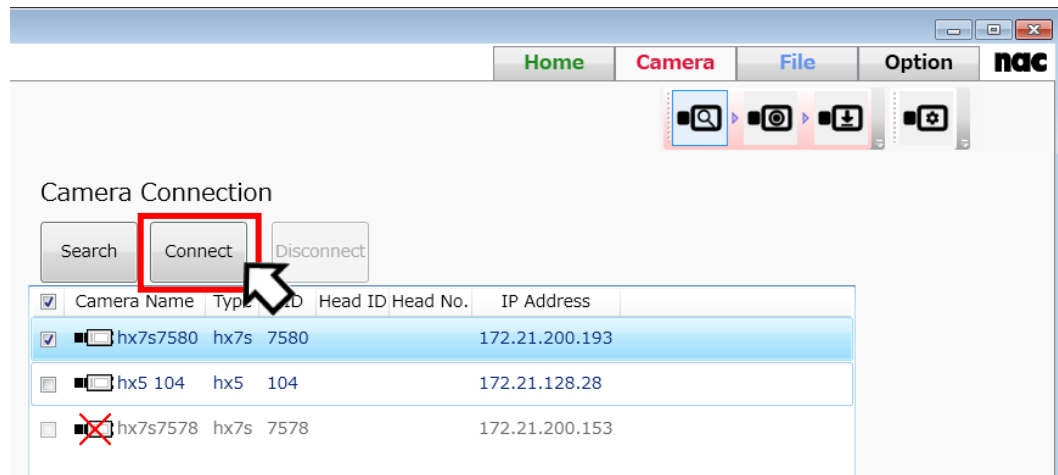
Once the camera search is complete, the nickname for the cameras discovered, model, IP address, CID, camera head ID and camera head number are shown on the list.



Connect Camera

Connect to the camera selected from the list.

Once the connection is complete, the "Record" screen automatically appears.



"Connect" cannot be clicked unless a camera is selected.

Connection is not possible if a camera is being used on a different PC.

The camera icon shown in the camera name column of the list shows the camera status.



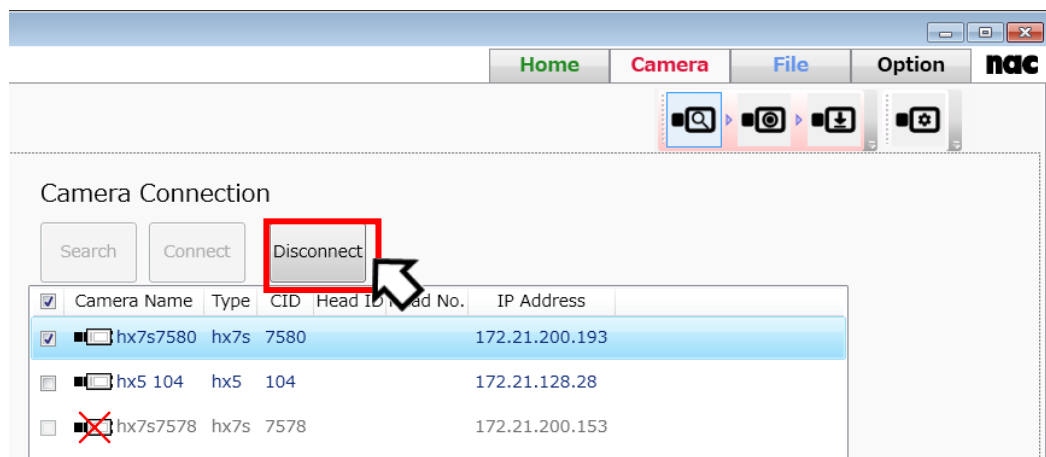
Camera that can be connected.



Camera that cannot be connected because it is being used on a different PC.

Disconnect Camera

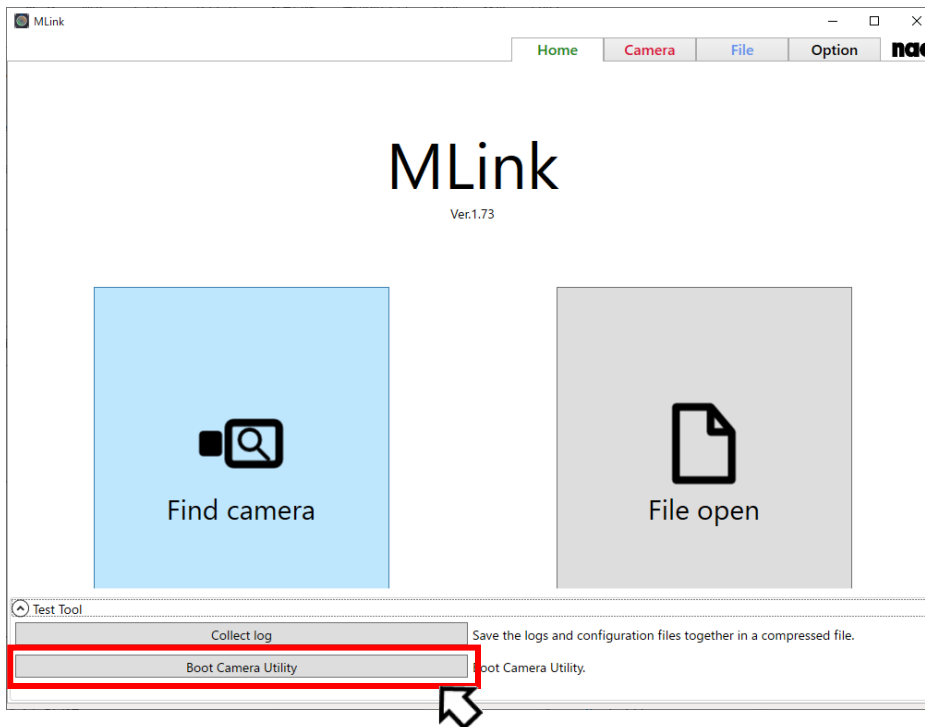
Disconnects the connected camera.



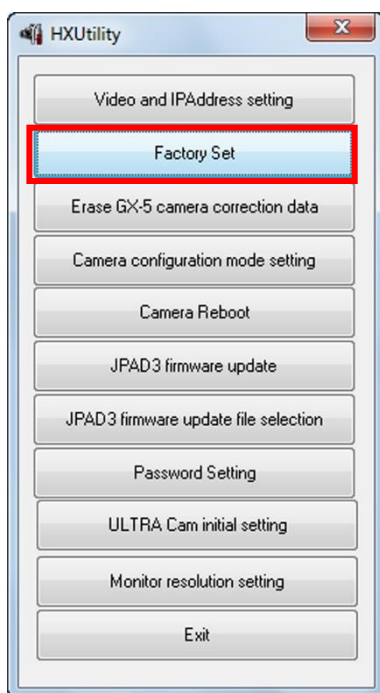
Factory Reset

Resets the selected camera to its factory defaults. This function erases the settings and recorded images on the camera.

Setting with the following procedures.

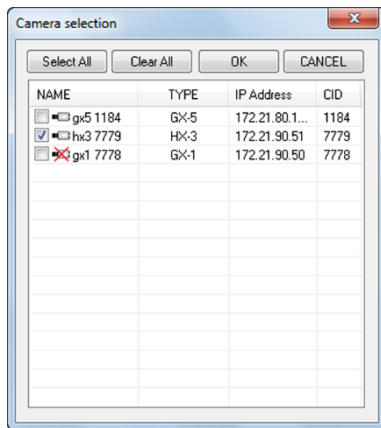


Click "Boot Camera Utility" button in Test Tool in Home Tab.



Confirm cameras with the settings have started up and the PC and cameras have connected to the network. Additionally, confirm that the camera is not in use.

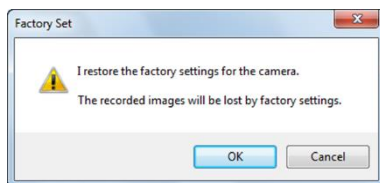
Click "Factory Settings".



The "Select Camera" dialogue is displayed with a list of cameras currently connected to the network.

An "x" is shown on the camera icon of the camera which can't be connected. (In use, or the IP address of Q camera is not on the network segment of PC)

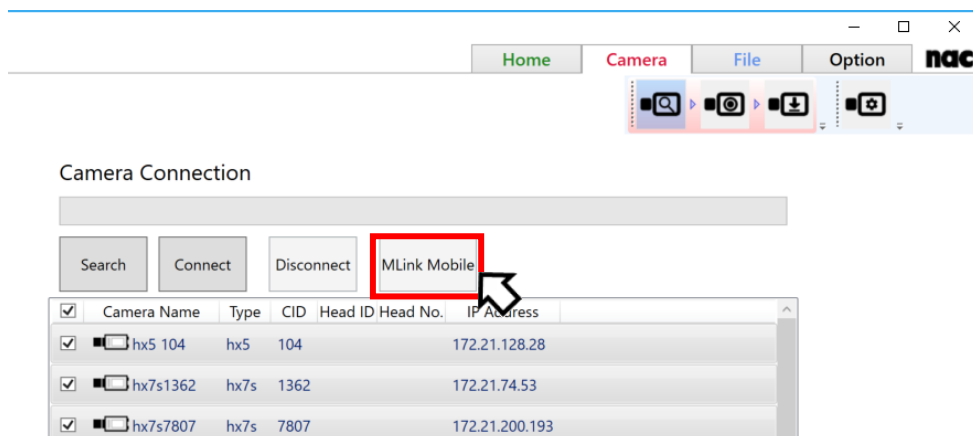
Check a camera to set and click "OK".



A confirmation dialogue appears. Click "Yes" to change to the factory settings and restart the camera.

Camera - Mobile connection

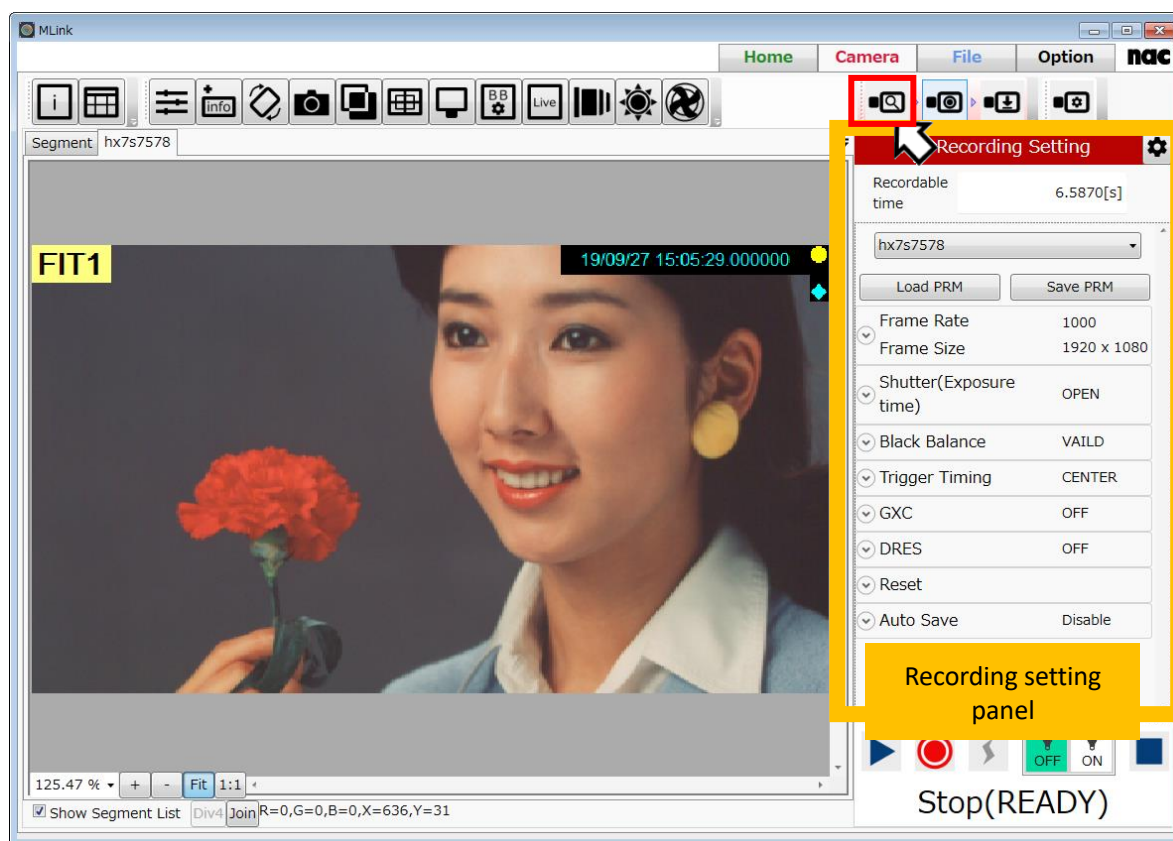
Live images can be displayed on iPhone and other mobile terminals via Wi-Fi.
(refer to ⇒p.188 "4.2 MLink Mobile")



4.1.2 Record

Select "Record" from the camera task tool bar and the recording screen appears.

Use the recording screen to make the recording settings and record.



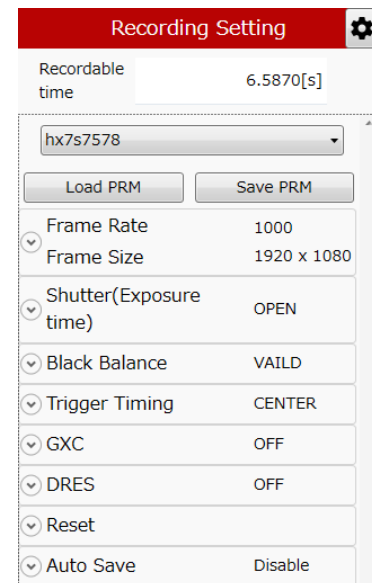
"Record" Screen

Recording Settings Panel

The recording settings panel is used for the recording settings corresponding to the subject, including frame rate and frame size.

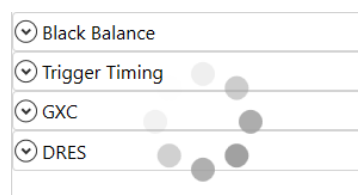
Items that can be set are as follows.


- **Setting Target**
- **Reading / Saving Camera Settings**
- **Frame Rate and Resolution**
- **Shutter (Exposure Time)**
- **Black Balance**
- **Trigger Timing**
- **GXC**
- **DRES**
- **Reset**
- **Auto Save**



| Recording Setting | |
|---|-------------|
| Recordable time | 6.5870[s] |
| hx7s7578 | |
| <input type="button" value="Load PRM"/> <input type="button" value="Save PRM"/> | |
| Frame Rate | 1000 |
| Frame Size | 1920 x 1080 |
| Shutter(Exposure time) | OPEN |
| Black Balance | VAILD |
| Trigger Timing | CENTER |
| GXC | OFF |
| DRES | OFF |
| Reset | |
| Auto Save | Disable |

When the camera is in standby and operations such as a change of settings aren't being performed or when the camera is not connected, a circular graphic appears on the settings item on the settings panel.



The item name and current setting is shown for each item. Click  on the item to open it and change the setting.

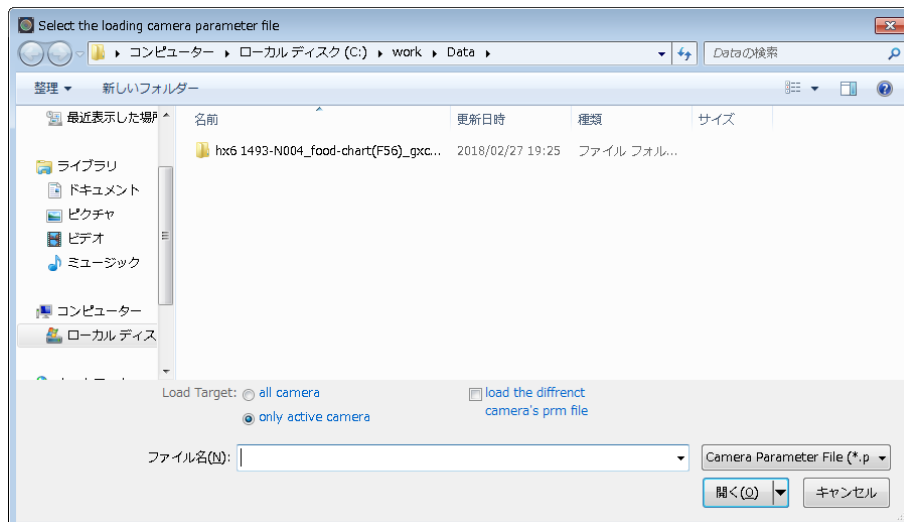
Setting Target

Shows the camera subject to the settings. The parameters for the target camera are shown in each item on the settings panel. Changes for the setting items are reflected in the cameras shown here.

Reading / Saving Camera Settings

Load PRM

Read the camera shooting conditions and other settings from the parameter file (prm) and set it to the target camera. Click the "PRM Read" button to display the parameter setting file read dialog box.



By selecting the PRM file and clicking the "Open" button, you can set the contents of the PRM file to the camera. You can set the camera to be set with "Applicable".

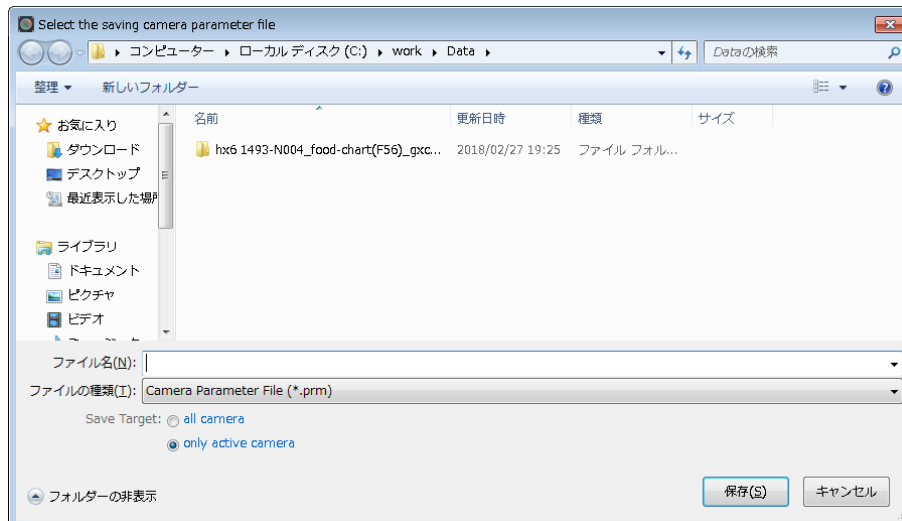
[all cameras] Set to all cameras described in the PRM file.

[only active Camera] Set only to the currently active camera.

If [load the different camera's prm file] is checked, set the recording setting at the head of the PRM file to the active camera. If it is not checked, the setting will not be made to the active camera only if the recording setting of the active camera is described inside the PRM file.

Save PRM

Save the settings such as the current shooting conditions of the camera in the parameter file (prm).

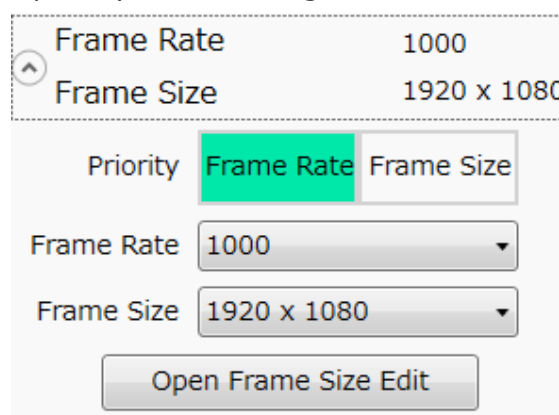


When [all cameras] is selected, the recording settings of all the connected cameras are written to one PRM file. If [only active camera] is selected, write the recording setting of only one active camera to one PRM file.

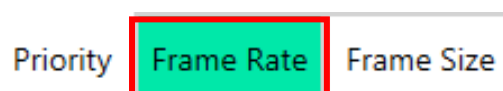
Frame Rate and Resolution

“Priority” sets the priority for either the frame rate or the frame size.

The item set that has priority is shown in green.



When the Priority is set to Frame Rate:



Use “Frame Rate” to select any of the frame rates that can be set on the camera.

Use “Resolution” to select only the resolutions that can be set with the frame rate selected.

When the Priority is set to Resolution:



Use “Resolution” to select any of the resolutions that can be set on the camera.
Use “Frame Rate” to select only the frame rate that can be set with the resolution selected.

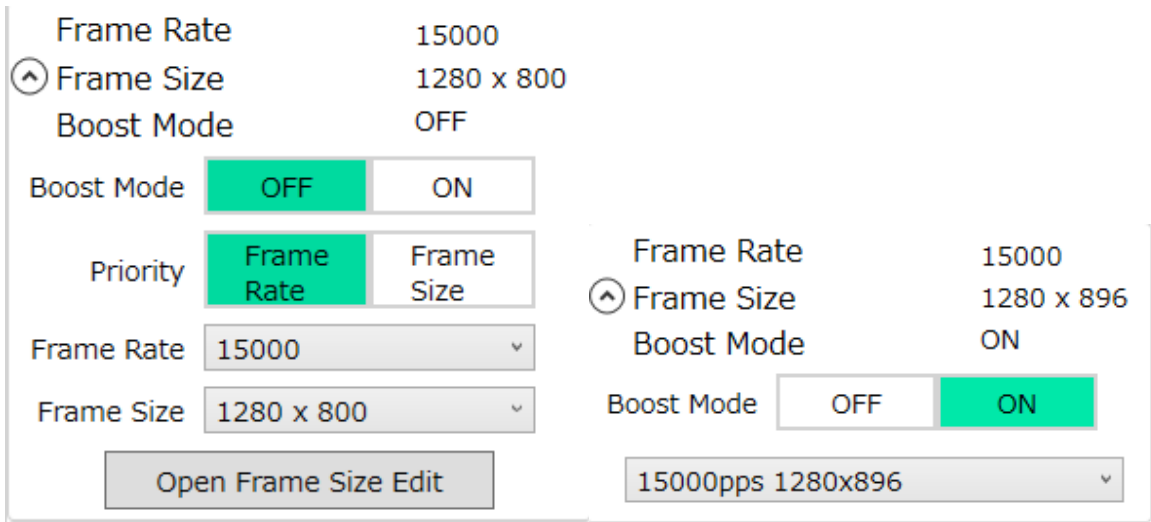
Review the filming time possible with the set “Frame Rate” and “Resolution” from the
“Filming Time Possible” at the top of the panel.



Click “Open Frame Size Details” to open the frame size details panel. (refer to ⇒p.151)
Use the frame size details panel to make custom settings for the frame size and frame rate.

Boost Mode

If the camera supports Boost mode, Boost Mode settings are displayed in "Frame Rate and Resolution".



Boost Mode is a function that increases frame rate or resolution with little image degradation.

When Boost Mode is turned on, the setting screen of frame rate and frame size will be changed to show only the settings available in Boost Mode.

For cameras that support Boost 4 mode, both settings for Boost mode and Boost 4 mode are shown in the pull-down menu. The settings for Boost 4 mode have "Boost4" next to the frame rate and frame size.

Example: 30000pps 1280x896 Boost4

In Boost mode, only preset frame rate and frame size are available, and custom frame rate and frame size are not available.

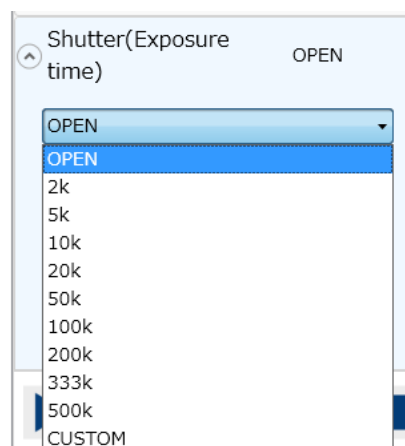
Boost mode cannot be used simultaneously with the following functions.

- Recording Trigger Mode (refer to ⇒p.110)
BURST, BURST(A), BURST(L), MULTI1(A), MULTI1(C), MULTI3(A), MULTI3(C), LINEAR
- Variable Frame Rate Recording (refer to ⇒p.114)
- Frame Straddling (refer to ⇒p.114)
- Reset Trigger (refer to ⇒p.113)

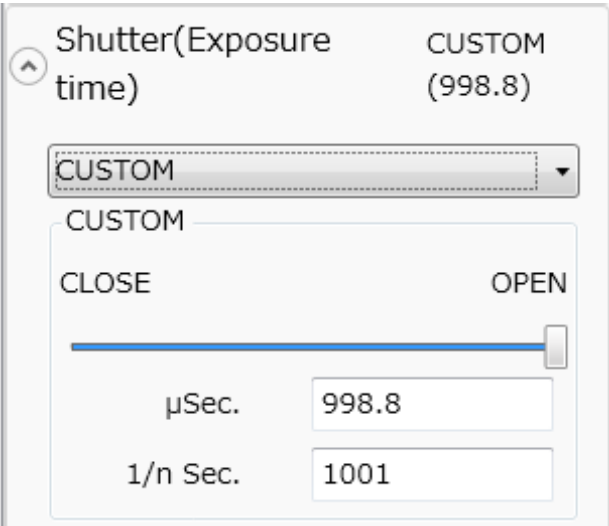
Shutter (Exposure Time)

The shutter speed can be changed. (The values that can be set depend on the model.)

You can select the settable shutter speed of the camera.



When CUSTOM is selected, the shutter speeds that can be set for the camera can be made by selecting on the slider or by numerically inputting in microseconds.



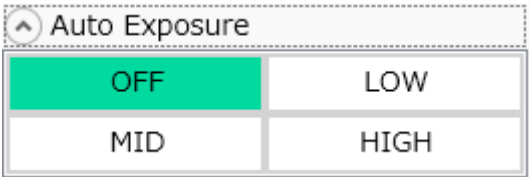
【Examples of corresponding shutter speeds and exposure times】

| | |
|-------|------------------|
| OPEN | 1/frame rate sec |
| 1 k | 1/1,000 sec |
| 2 k | 1/2,000 sec |
| 5 k | 1/5,000 sec |
| 10 k | 1/10,000 sec |
| 20 k | 1/20,000 sec |
| 50 k | 1/50,000 sec |
| 100 k | 1/100,000 sec |
| 200 k | 1/200,000 sec |
| 333 k | 1/333,333 sec |
| 500 k | 1/500,000 sec |

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

Automatic Exposure Control (AEC)

The AEC (automatic exposure control) function is available on the HX camera and the GX-1/GX-3/GX-8 cameras and ACS camera.



The AEC function performs photometry in a specific area of the photographed image, and changes the shutter speed so the average luminance in the photometry area is a specific value.

The lens aperture and shutter settings can be determined by the lighting for interior photography but it is difficult to change the settings each time the light changes for exterior photography. The AEC function is effective in these situations.

However, if the light changes rapidly, it will take several seconds to get to the appropriate value.

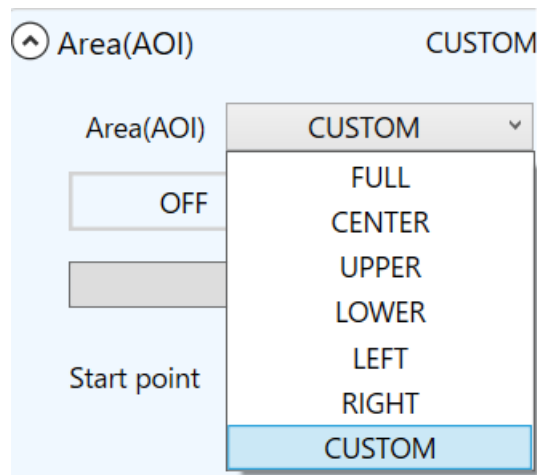
| Set Value | Description |
|-----------|--|
| OFF | AE not in use. |
| LOW | Adjusted so the average luminance is low. |
| MID | Adjusted so the average luminance is standard. |
| HIGH | Adjusted so the average luminance is high. |

Area(AOI)

For HX camera AE control, it is necessary to specify the target area (AOI).

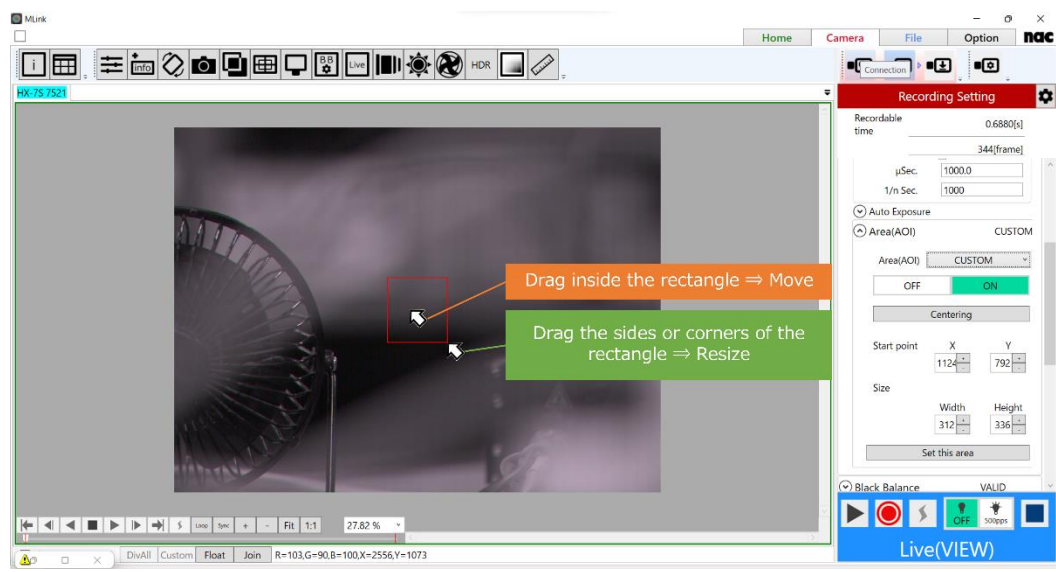
You can specify one of the following as the range from the "Area (AOI)" pull-down.

| Set Value | Description |
|-----------|---|
| FULL | The entire frame is the range. |
| CENTER | The range is a rectangle that is 50% vertically and horizontally (25% area) from the center of the frame. |
| UPPER | The upper half of the frame is the range. |
| LOWER | The bottom half of the frame is the range. |
| LEFT | The left half of the frame is the range. |
| RIGHT | The right half of the frame is the range. |
| CUSTOM | Any range can be specified by the user. |



How to specify AOI

For the AOI setting, select "CUSTOM" from the "Area (AOI)" pull-down and switch it to "ON" to draw a red frame on the image and apply it. You can also specify the AOI with a rectangle by dragging on the live image in the image display area. Drag inside the rectangle to move the AOI. Drag the corners or sides of the AOI rectangle to resize the AOI. Drag outside the AOI rectangle to discard the current AOI and specify a new AOI.

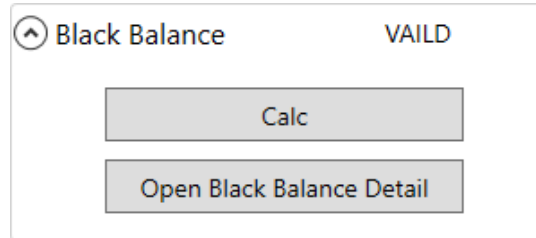


Black Balance

Black balance is a function to correct the pixel dependent noise elements from the sensor. The GX, MX and Q cameras can record without black balance correction but if conducting highly detailed photography, we recommend performing black balance immediately before or after filming.

Since the black balance eliminates noise elements from the sensor dependent on the settings such as frame rate and frame size, if the frame rate or frame size is changed

while the black balance is ON, a warning prompting black balance correction will appear on the video monitor and in the warning window. If using the black balance function, update the black balance with the same frame rate and frame size as that for photographing.



Click "Open Black Balance Details" to open the black balance detail panel. (refer to ⇒p.154)
 The settings for the automatic black balance can be made in the black balance detail panel.

Procedures for Updating the Black Balance

Set the "Frame Rate" and "Frame Size" for photographing.

With GX, MX and Q cameras, put the lens cap on so light cannot enter the sensor.

Click "Calculate the Black Balance".

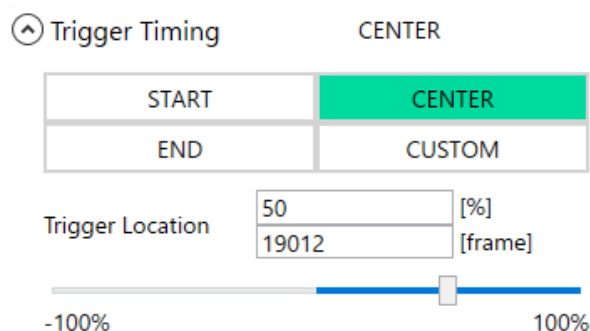
Record images to created correction data.

When creating correction data, the status for the black balance will transition as follows.

| | |
|-------|-------------------------------------|
| NONE | Black balance is not ready. |
| BUSY | Black balance is being updated. |
| VALID | Black balance updates are complete. |

Trigger Timing

Sets the trigger timing. The trigger timing determines the number of frames recorded before and after the trigger input.



| Set Value | Description |
|-----------|---|
| START | The trigger frame is about 5% from the beginning of the recording memory. |
| CENTER | The trigger frame is at the center (about 50%) of the recording memory. |
| END | The trigger frame is about 5% from the end of the recording memory. |
| CUSTOM | The trigger frame is specified from the range equivalent to -100% through 100%. |

If CUSTOM is selected, you can specify the trigger frame by % or frame number. You can specify the trigger frame by manipulating slider.

You can do a similar setup with **Trigger Timing** in **Photographing Menu**. For more information, refer to **p.101**.

GXC

Setting used for GXC. This function is only valid with HX cameras.

If used, it is possible to increase the sensitivity about 4 times without a corresponding increase in noise. However, the maximum frame size becomes 1/2. For example, the HX-3 is limited to 1280×960.

| Set Value | Description |
|-----------|-----------------|
| ON | GXC in use. |
| OFF | GXC not in use. |

DRES

Sets the dynamic range expansion shutter mode. Used with HX and GX cameras.

The camera sensor compresses the high brightness parts so the dynamic range can be expanded.

| Set Value | Description |
|-----------|---|
| OFF | Standard setting. The dynamic range is set to about 200%. |
| LOW | The dynamic range is set to about 400%. |
| MID | The dynamic range is set to about 800%. |
| HIGH | The dynamic range is set to about 1600%. |

When in the DRES mode, the “Gain” and “Knee” settings are not applied, with the gain at LOW and the knee at ON.

Reset

Reset

Scene No 0 + -

DRP ID 0 + -

Default set(Only this camera)

Default set(All cameras)

Nickname

Modify

Scene No

An optional number is set for each shooting.

DRP ID

In case of multi camera head model, ID for each DRP is set.

Default set (Only this camera)

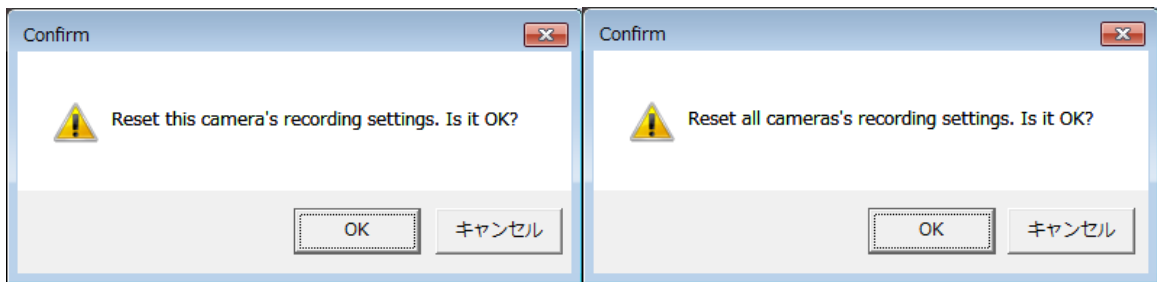
The recording settings of the currently selected camera are initialized.

Default set (All cameras)

All camera recording settings are initialized.

Record setting initialization is a function to reset to the factory default settings. However, scene numbers and DRP IDs in the recording settings are not reset. Also, it does not affect the recorded data.

Push “Default set” button and then the following screen appears.



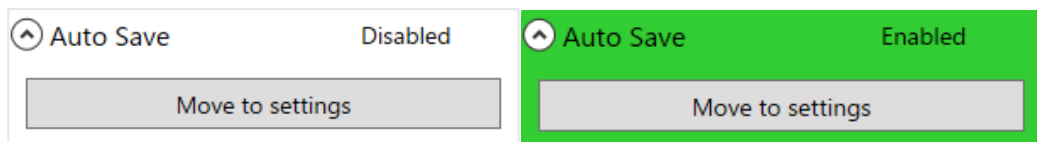
Only this camera

All cameras

Nickname

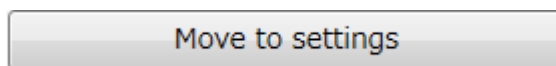
You can change the nickname of the camera. The nickname must be different from those already registered. For more information, refer to **p.281**.

Auto Save



Auto Save

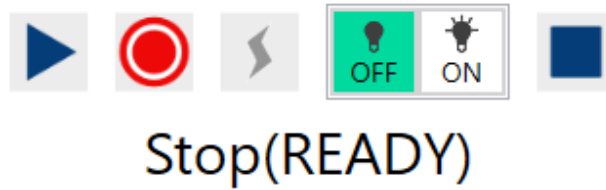
The background is displayed in green if any of **Download automatically after recording**, **Convert automatically after downloading**, or **Convert in a separate process after downloading** are enabled.



Move to settings “Auto Settings” screen of “Automatic Control” on “Option” when “Move to settings” button is pushed. For more information, refer to **p.286**.

Control Panel

Controls the camera from the control panel on the bottom of the screen.



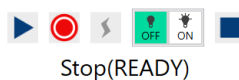
The operation of each button is as follows.

| Button | Name | Operation |
|--------|-----------|---|
| | View | Shifts the camera from the stop state to the view state. |
| | Record | Shifts the camera from the stop/view state to the record (standby) state. |
| | Trigger | Inputs the trigger to the camera to end recording. |
| | Low Light | Turns ON/OFF the low light function of the camera and sets the brightness for it. (⇒ Refer to p.74) |
| | Stop | Stops the view/record (standby)/record state of the camera. Release the warning displayed on the video output with the GX camera. |

The control panel indicates the following camera statuses.

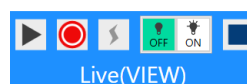
• READY

Background Color : White



• VIEW

Background Color : Blue



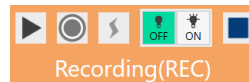
- **ARM (Standby)**

Background Color : Red



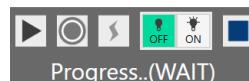
- **REC**

Background Color : Orange



- **WAIT**

Background Color : Gray



Low Light

There may be cases that you cannot obtain a clear monitor image in VIEW mode with low lighting while preparing for recording. When the low light mode is turned on, you can get images brighter than the actual frame rate and shutter settings during VIEW mode, and you can use it for adjusting the angle of view and lens focus.

When you set ARM mode and start a recording, the display of low light mode will disappear, and images will be displayed at the brightness according to the recording settings.

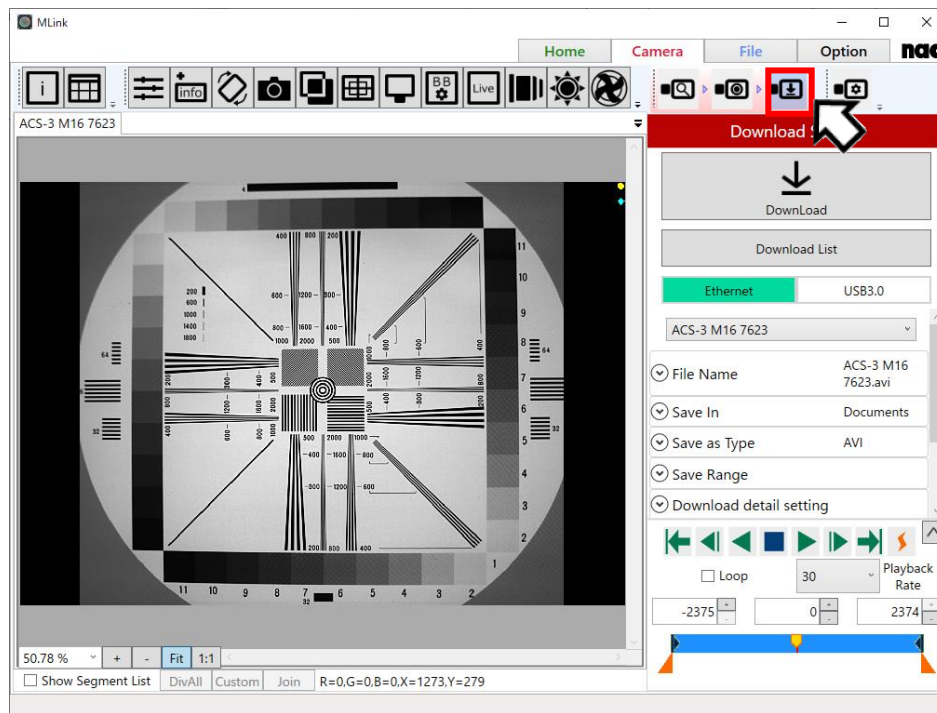
In low light mode, images are expanded to the full resolution of camera, and the recording area is indicated by a rectangle. This function is also useful for when adjusting the angle of view with small frame size setting since it displays area outside of the recording area.

When adjusting shutter speed or the aperture of lens, turn OFF the low light mode to obtain images with the same brightness as the actual recording. To adjust the angle of view with low light mode, make sure that the subject is within the rectangle indicating the recording area.

On the control panel, you can turn ON and OFF of the low light mode and select the brightness from 100, 250, 500 or 1000pps. For more detailed brightness setting, use "Camera setting list". (⇒ Refer to p.119)

4.1.3 Play and Download

If "Download" is selected from the camera task tool bar, the download screen appears.
The recorded camera images are played back on the download screen for review.



"Play" Screen

Control Panel

You can playback the recorded images and select the playback range using the control panel at the bottom of the screen.

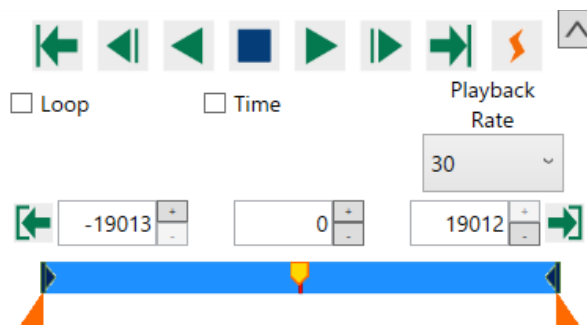















Image Review Operation

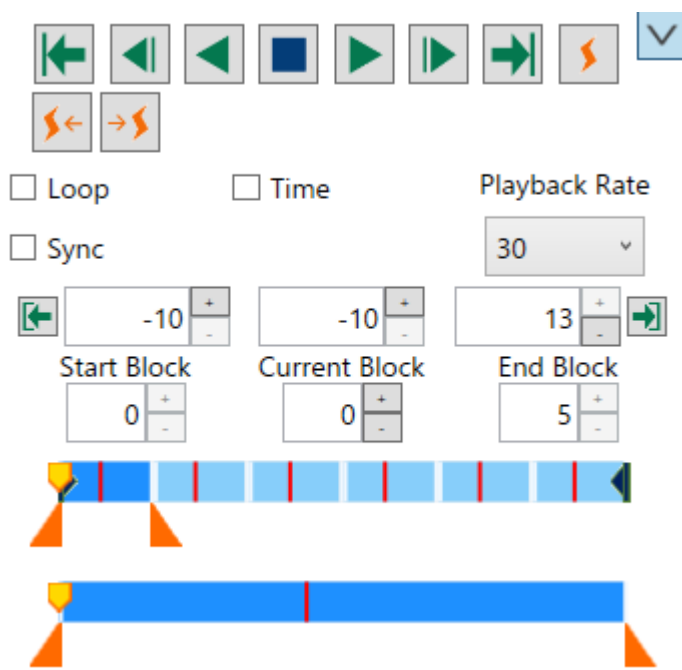
Use the buttons on the control panel to review the photographed images.

Description of each button is as follows.




| Button | Name | Description |
|---|------------------------|--|
|  | To start frame | Move the current frame to the start frame. |
|  | Back 1 frame | Back 1 frame. Only available during stop. |
|  | Decrease playback rate | Slow down the playback rate. Only available during playing back. |
|  | Play | Start playback. |
|  | Reverse play | Start reverse playback. |
|  | Stop | Stop playback. |
|  | Forward 1 frame | Forward 1 frame. Only available during stop. |
|  | Increase playback rate | Speed up the playback rate. Only available during playing back. |
|  | To end frame | Move the current frame to the end frame. |
|  | Trigger jump | Move the current frame to the trigger frame. If block partitioning, move to the trigger frame of the next project. |
| <input type="checkbox"/> Loop | Loop play | If checked, playback loops within the playback range. |

| Button | Name | Description |
|---|-----------------|--|
| <input checked="" type="checkbox"/> Time <div>sec ▾</div> | Time display | If checked, the playback range is displayed in time instead of frames. The pull-down menu allows switching the unit of time. |
| Playback Rate <div>30 ▾</div> | Playback rate | Select playback rate in the pull-down menu. |
|  | Set start frame | Sets the current frame as the starting frame. |
|  | Set end frame | Sets the current frame as the ending frame. |

The  button is an extension button. Clicking this turns ON/OFF the display of the block range, current block and slider.



The operation of the added button is as follows.

| Button | Name | Operation |
|---|-------------------|--|
|  | To previous event | Move from the current frame to the previous event. |
|  | To next event | Move from the current frame to the next event. |
|  | All | <p>If you are connected to multiple cameras and this synchronization is checked, frames of other cameras are also changed following the frame operation of the active camera. If the MLink live update is set to "All cameras" the image will also be updated at the same time. (refer to ⇒p.159)</p> <p>During frame synchronization, the color of the control panel is displayed in green.</p> |

Slider Configuration

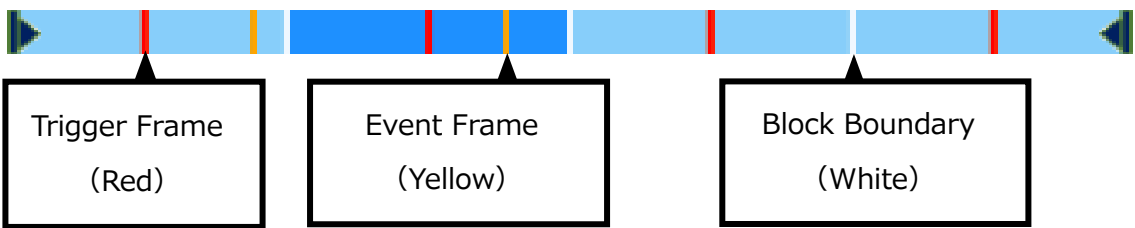
The slider has two levels that are synchronized that operate as a single slider.
The top slider shows the entire recording range.
The bottom slider shows the playback frame range.



If the drop-down menu is closed, only the top slider appears.

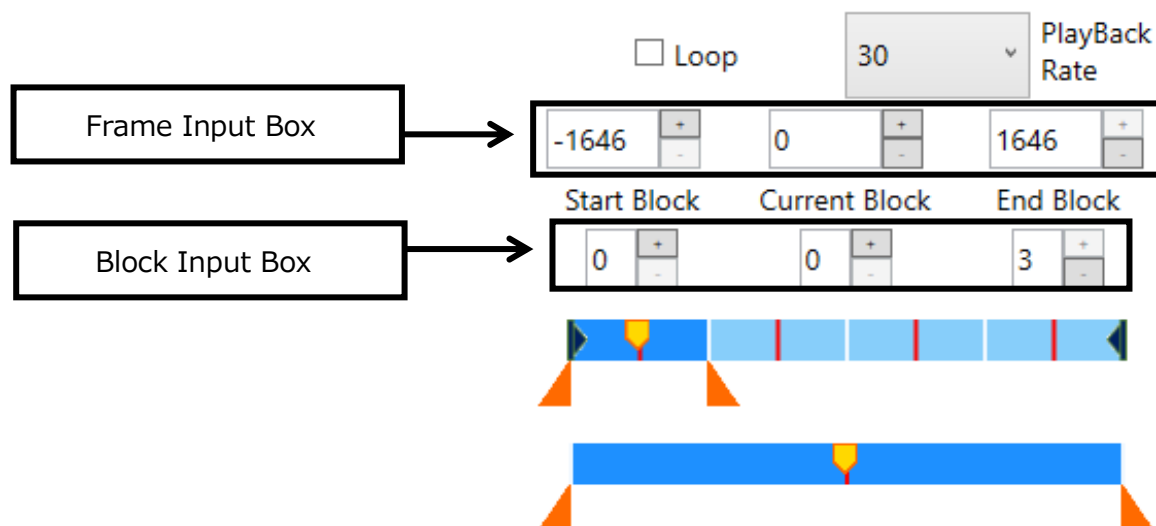
Trigger Frame Display

The trigger frame and event frame is shown on the slider.

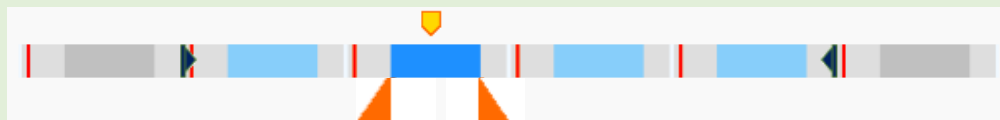


Playback Range and Current Frame Operation

The playback block range, playback frame range and current frame selection can be set by changing the numbers in the frame input box or by operating the range selection knob from the slider.



If the playback frame range was set with the image recorded in a multi-block, the same playback frame range is set for all of the blocks. Different playback frame ranges cannot be set for each block.

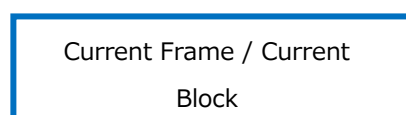


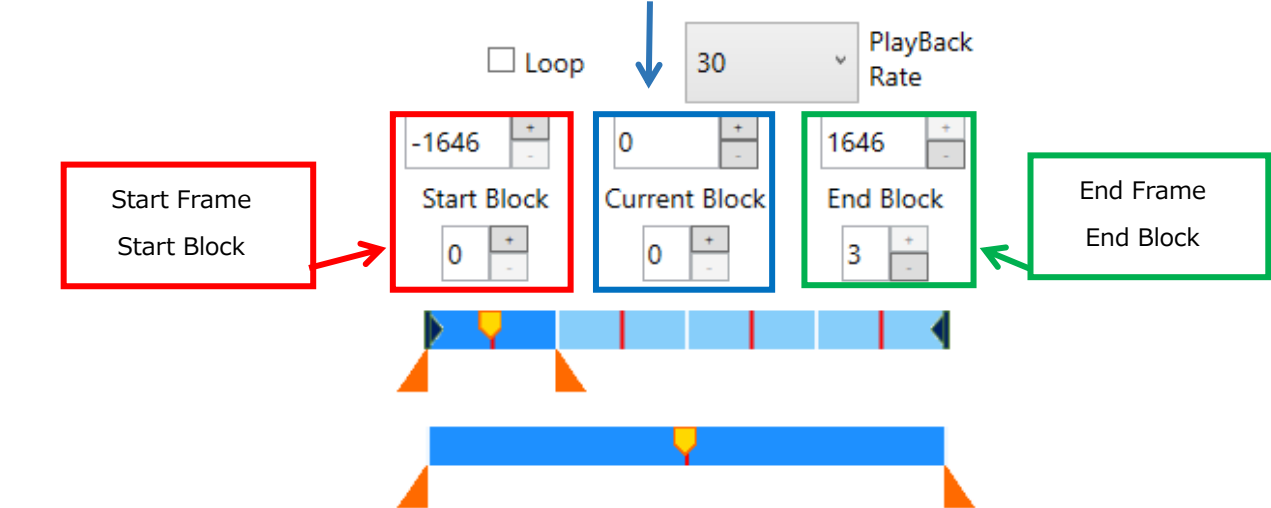
The same playback frame range for all blocks

Also, the playback block range and the playback frame range are set for a continuous section. Non-continuous sections cannot be designated.

Operating Method for the Frame Input Box

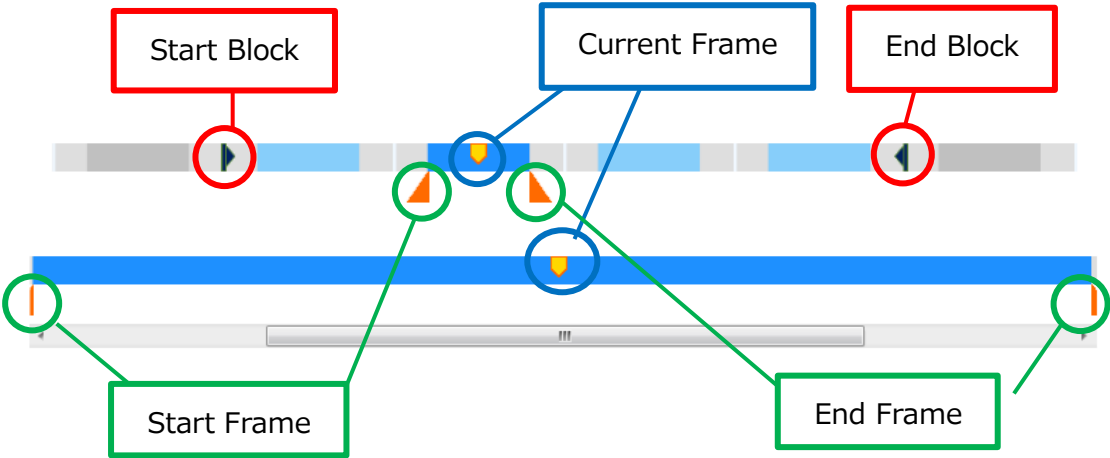
The 6 frame input boxes are used to operate the "Block Range", "Frame Range" and "Current Frame / Current Block". Click the drop-down menu to show the "Current Block" and "Start/End Block".





Use the up/down arrows on the right side of the frame input box to change the values of a single frame or a single block within a range that can be set. Direct input from the keyboard is also possible.

Names of the Slider Parts

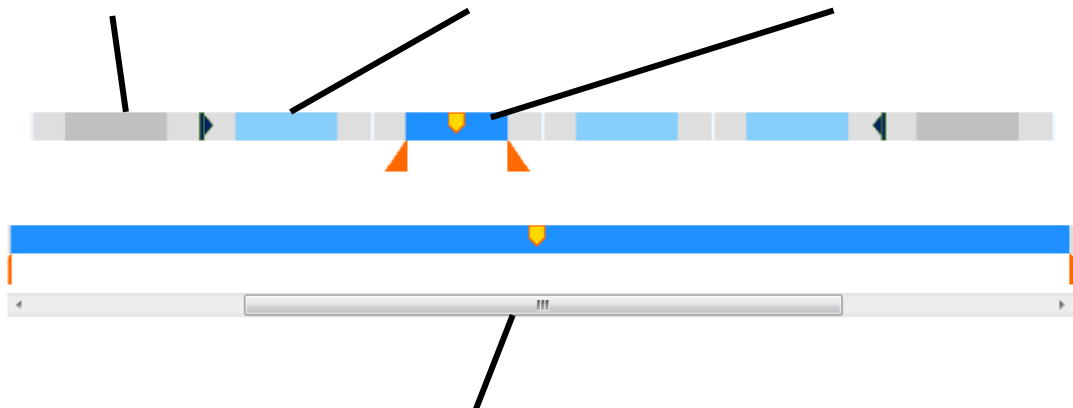


The operation of the start frame, end frame and current frame are synchronized with the up/down slider so if one of the knobs is moved, the other knob moves to show the same frame.

The section within the playback frame range for each block is shown in the same color.

The block within the playback block range is shown in blue.



The color of the range of the current block is lighter.

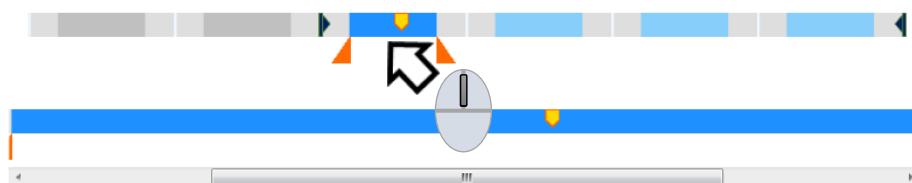


Move the scroll bar on the bottom slider to the left and right to review the recording information outside the playback frame range with the magnification of the playback frame range.

The playback block range can only be manipulated with the top slider.

Change the playback block range according to the following procedures.

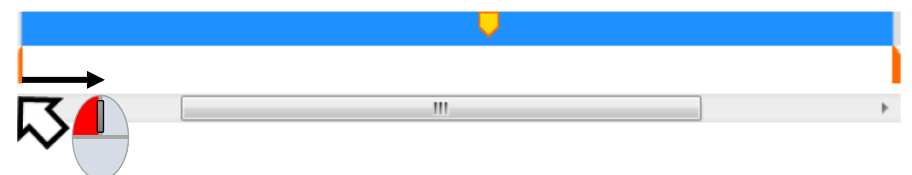
- The start block is adjusted with  while the end block is adjusted with .



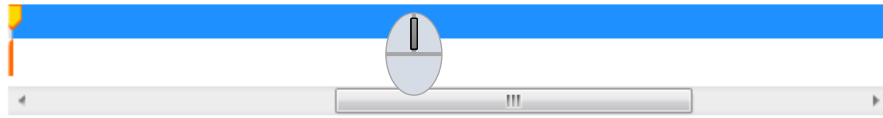
The playback frame range can be adjusted with either the top slider or the bottom slider.

Change the playback frame range according to the following procedures

- The start frame is adjusted with while the end frame is adjusted with .



2) Release the mouse in the location of the start or end frame to be set.



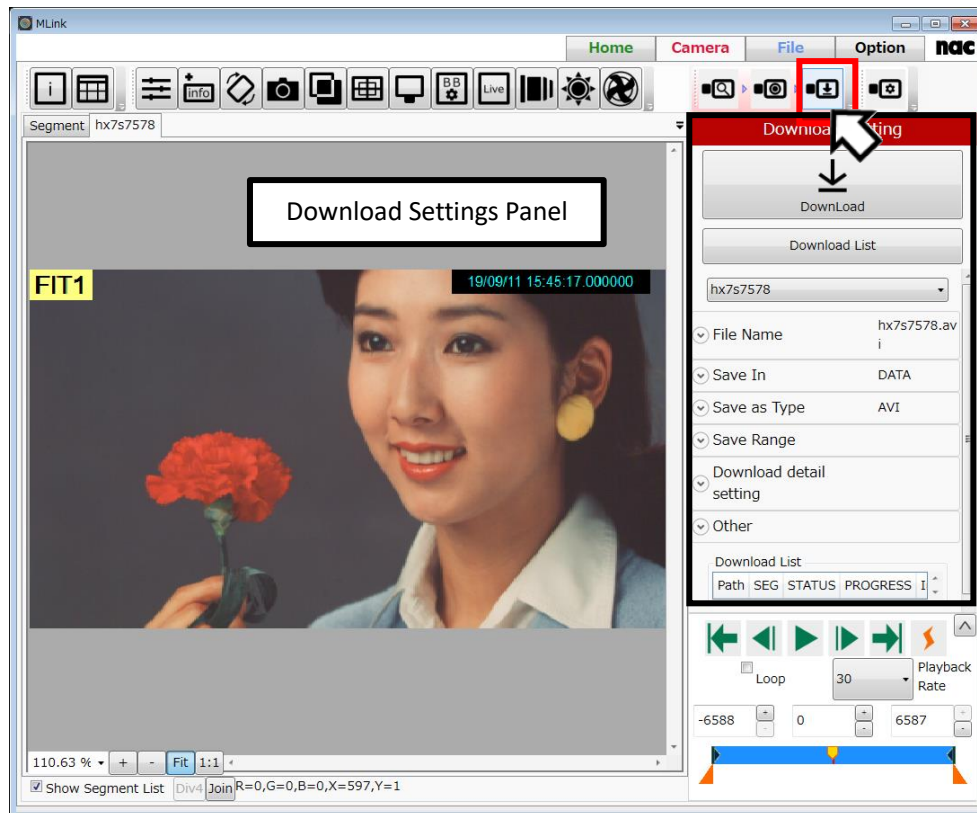
Release the mouse and both ends of the bottom slider so the playback frame range shows the status after the changes. Thus, the frame for the playback range changed becomes the current frame.

If there are many recording frames, it will become difficult to select detailed frames on the top slider showing all of the frames. Narrow the playback frame range so a narrower playback frame range is shown and it will be possible to select frames on the bottom slider.

Download

Select "Download" from the camera task bar and the download screen appears.

Use the download screen to download images recorded with the camera to a PC.



"Download" Screen

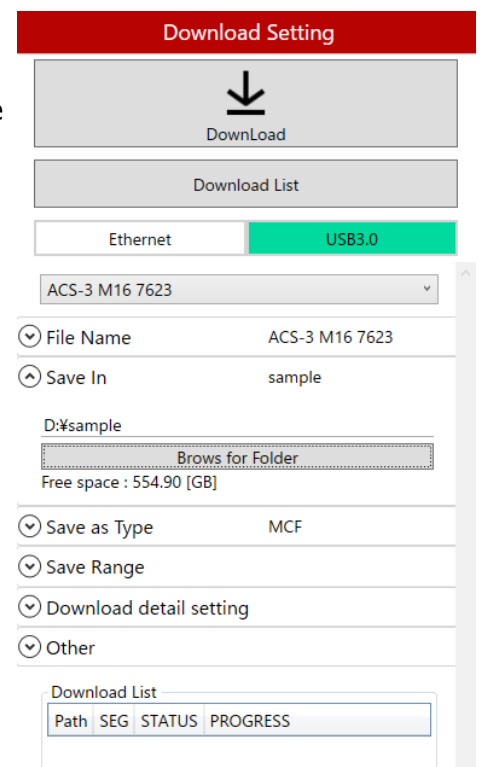
Download Settings Panel

Use the download settings panel to set the save file name, save folder location and save format, and then download the recorded images to a PC.

The items that can be set are as follows.

When the save location is set, the free space of the save location is displayed.

- File Name
- Save Location
- Save Format
- Save Range
- Detailed Download Settings
- Other



Download

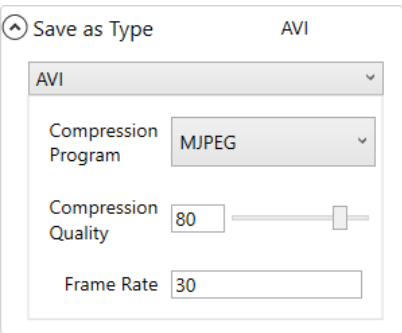
Once the save file name, save location and save format are set, click "Start Download" to download.

The screenshot shows the 'Download Setting' dialog box. It features a red header bar with the title 'Download Setting'. Below the header, there is a 'Download' button with a downward arrow icon. Underneath is a 'Download List' button. A text input field contains the value 'hx7s7578'. Below this are several expandable sections, each with a downward arrow icon: 'File Name' (showing 'hx7s7578.avi'), 'Save In' (showing 'DATA'), 'Save as Type' (showing 'AVI'), 'Save Range', 'Download detail setting', and 'Other'. At the bottom, there is a 'Download List' section with a table showing columns: Path, SEG, STATUS, PROGRESS, and I.

The save formats that can be set for a download are as follows.

| File Format | Extension | File Type |
|---------------------------------|-----------|--------------------|
| MCFF | .mcf | MCFF |
| AVI | .avi | Color 24bit AVI |
| AVI (Monochrome) | .avi | B/W 8bit AVI |
| TIFF (Monochrome 8bit) Sequence | .tif | B/W 8bit TIFF |
| TIFF (24bit) Sequence | .tif | Color 24bit TIFF |
| BMP (24bit) Sequence | .bmp | Color 24bit bitmap |
| BMP (Monochrome) Sequence | .bmp | B/W 8bit bitmap |
| Jpeg Sequence | .jpg | Color 24bit JPEG |
| TIFF48 (48bit) | .tif | Color 48bit TIFF |
| TIFF16 (Monochrome 16bit) | .tif | B/W 16bit TIFF |
| TIFF16 (RAW) | .tif | B/W 16bit TIFF |

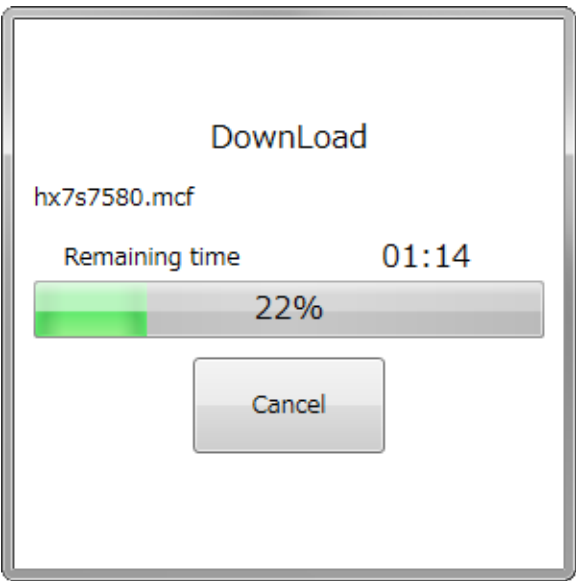
If downloaded in the AVI format, select “AVI” as the save format and the CODEC used for the files saved in the AVI format, the compression quality and playback rate can be set.



Progress Display and Suspending Processing of Downloads

Once a download starts, the progress dialog appears. The progress of the download is shown as a percentage.

If “Suspend” is clicked at this point, the current download is suspended.



When a download is completed, the status on the display list is “Completed” and the progress shows “100”.

| Download List | | | |
|---------------|-----|-----------|----------|
| Path | SEG | STATUS | PROGRESS |
| C:\Users\n | 1 | Completed | 100 |

Download Detailed Settings

Set the download method or operation after downloading.

Set before starting to download.

Download detail setting

☒ Make the convert range same as the playback range

☒ Open the file, after download.

☐ Generate G data, after download.(Q,MX Series)

Multi Block

☒ Divide file on a block by block

☐ Save in a single file

Number of cameras for simultaneous download

Coordinate the Save Range with the Playback Range

If setting the save range in a range that is the same as the playback range, turn this setting ON.

If ON, the save range that is the same as the playback range is changed simultaneously with the change in the playback range from the control panel.

If OFF, the save range does not change even if the playback range is changed. Set the save range from "Save Range" on the download settings panel. This is a useful function when always downloading the same range.

Save Range

| Block | Start | End |
|----------------|-----------------------------------|----------------------------------|
| Recorded Range | 0 | 0 |
| Save Range | <input type="text" value="0"/> | <input type="text" value="0"/> |
| Frame | Start | End |
| Recorded Range | -102 | 101 |
| Save Range | <input type="text" value="-102"/> | <input type="text" value="101"/> |

Open the Downloaded File

Open the downloaded image file in the background.

Switch to the file tab to view the file (⇒p.235).

Create G data after download (Q, MX series)

Create a wave data file from the data recorded by G sensor of Q and MX camera.

After recording with Q and MX camera with G trigger turned ON, create wave data file (NWF) at the timing of MCFF download.

Then, G sensor data can be displayed in a graph.

| | | |
|-------|--|---------------------|
| Graph | displays G data and G trigger level | |
| | The unit of a vertical axis is [G] (acceleration). Range is 0~205. | |
| | <u>Data</u> | <u>channel name</u> |
| | G data | G |
| | G trigger level | Threshold |
| List | displays G data, G trigger level and existence of external trigger signals | |
| | <u>Data</u> | <u>channel name</u> |
| | G data | G |
| | G trigger level | Threshold |
| | Existence of external trigger signals | TRIG |

If you specify a waveform file (NWF) by file OPEN operation, it will be displayed in graph form.

Synchronous reproduction of image files and waveform files is not supported.

Save Method for Multi-Blocks

If downloading multiple block ranges, split the image file into blocks and set for saving.

“Splitting Files into Blocks”

Download one image file for each block.

The file name includes the format adding the number of blocks to the end of the file name, as follows.

(File Name) -B*** *** refers to the number of blocks

“Combine All Blocks into a Single File”

Download by combining all of the blocks into a single image file.

Number of cameras for simultaneous download

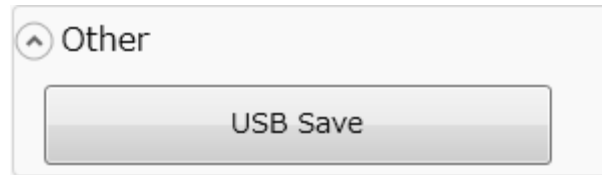
By specifying the number of cameras to be downloaded simultaneously, downloads from multiple cameras can be performed in parallel.

Simultaneous download is not available for Q series cameras. In the case of multi-head cameras, downloads from different DRPs are performed simultaneously, but downloads from cameras connected to the same DRP are performed sequentially.

Other

Make other settings related to the download.

USB storage can be performed here.

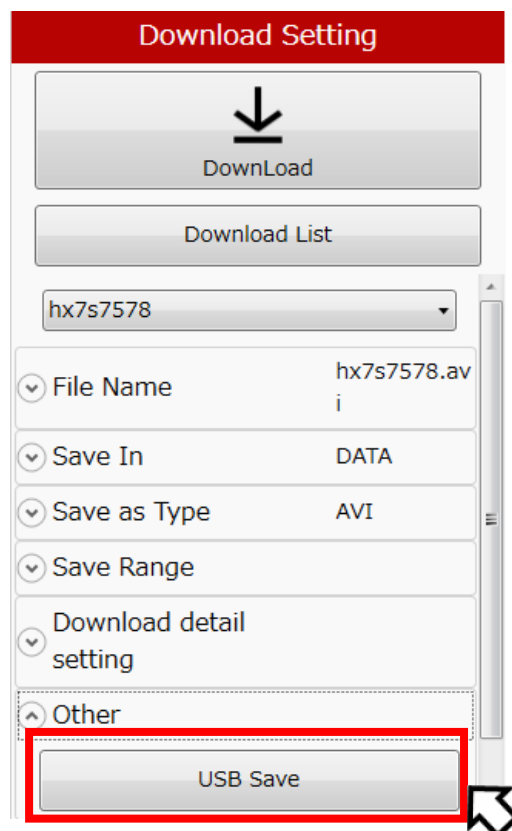


USB Save

Determine the save range for the data to be saved on USB media connected to the HX, GX, MX, ACS or GO cameras and save the camera image.

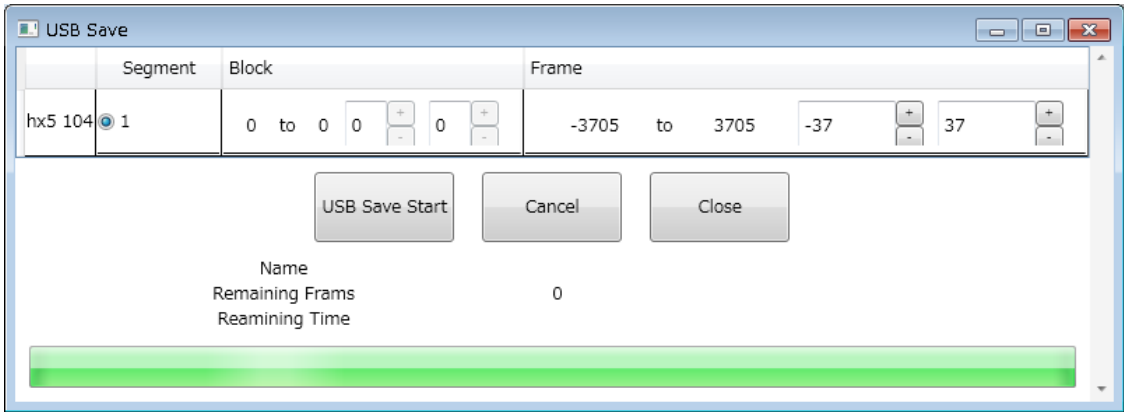
Perform the following procedures before connecting the USB media to the HX, GX, MX, ACS or GO cameras.

Open "Others" on the download setting panel and click the "Save USB" button.

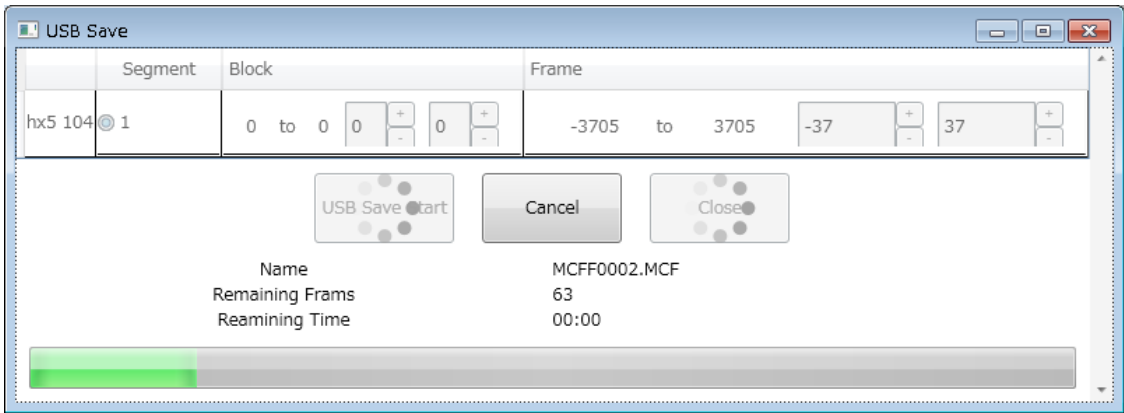


The "USB Save" dialog opens.

A list of segments is displayed. Please select the segment you want to download and specify the storage range. Click the "USB Save Start" button, downloading to the USB will start.



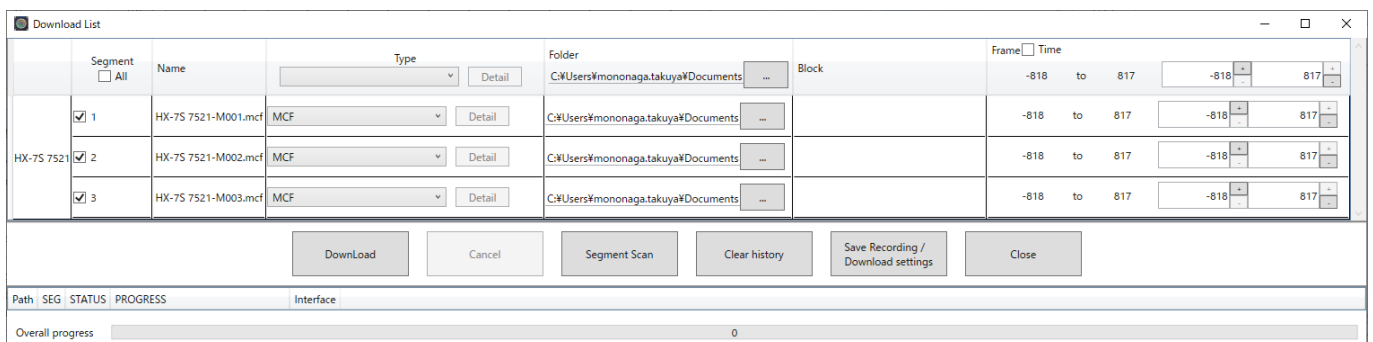
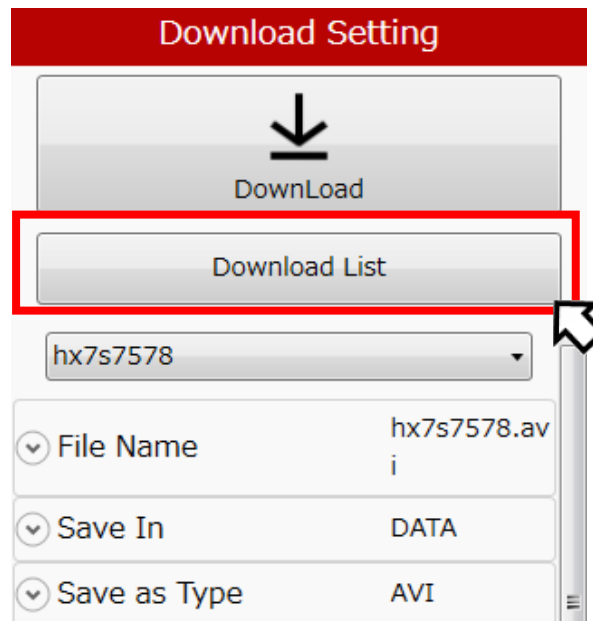
The format of the file is MCFF, and the sequential number of "MCFF0000.MCF" to "MCFF9999.MCF" is automatically specified as the file name. Progress bar and "remaining frame number" shows progress in real time while saving. If you press "Cancel", USB storage will be interrupted immediately.



The file format corresponds to MCFF only.

Batch Download

To open the "Download list" window, click "Download list" on the download setting panel.
you can download from multiple cameras at once.

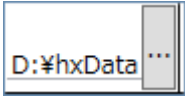


Download window

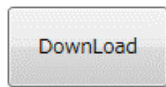
In the line of the camera, you can change the download settings of the selected camera and segment. You can set a value for all cameras and segments by entering to the top title line.

If the "Time" checkbox is checked, the range is displayed in time instead of frames.

In the "Download" window, you can set the following items.

| | |
|---|--|
| Segment | The checked data will be downloaded. If you do not download it please remove the check mark. |
| <input checked="" type="checkbox"/> All | |
| Name | Specify the file name attached to the data to be downloaded. |
| Type | Specify the file type. |
| Folder | <p>The folder where data to be downloaded is saved is displayed.</p> <p>To change the save folder, do the following operations.</p> <ol style="list-style-type: none"> 1. Click the "... " button of the save destination.  <ol style="list-style-type: none"> 2. The "Browse for Folder" window appears, so select the download destination folder and press the "Select Folder" button. |
| Block | <p>Start and end blocks of the storage range.</p> <p>It can be set in 1 block unit.</p> |
| Frame | <p>Start and end frames of the storage range.</p> <p>It can be set in 1 frame unit.</p> <p>When recording with multi trigger, set save start frame and end save frame for all blocks.</p> |

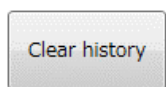
For each button in the "Download" window, do the following operations.



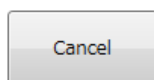
Download the data with the checkbox checked. The download progress of each camera is displayed in% in the "PROGRESS" column

During the download, the progress status of the download is displayed in the "Save status" column.

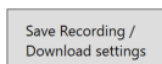
| Path | SEG | STATUS | PROGRESS | |
|--------------------------------|-----|-----------|----------|--|
| D:\#hxData\#gx5 1240-1-M01.mcf | 1 | Completed | 100 | |
| D:\#hxData\#hx5 104-M01.mcf | 1 | Completed | 100 | |
| D:\#hxData\#gx5 1240-5-M01.mcf | 1 | Saving | 32 | |
| D:\#hxData\#Q1V 5-M01.mcf | 1 | Reserve | 0 | |



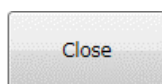
When you repeatedly download, the progress list will accumulate. By pressing this button, you can delete all the history of the progress list.



Abort the download.

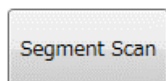


The recording settings of the connected camera and the download settings set in the download list are output as a parameter file. By specifying this file with the optional camera connection setting, it is possible to automatically reflect the setting at the time of connection or at the time of recording / downloading. (Refer to p.279)



Close the "Download list" window.

If the segment status is not displayed correctly, do the following.



Update the state of the segment.

Download REC

Camera operations can be executed while batch downloading HX cameras, ACS cameras and GO cameras.

By using it together with memory segmentation, recording to another segment can be executed during downloading.

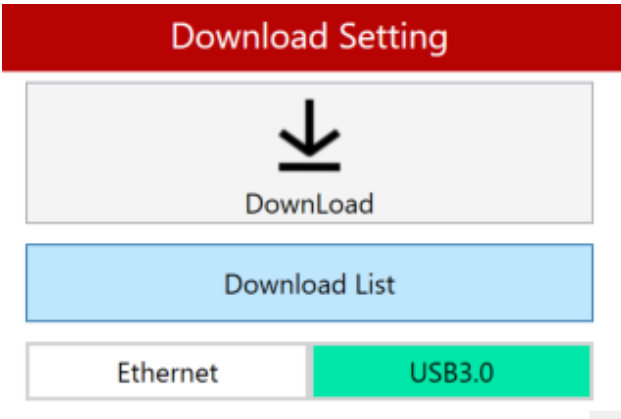
This function can be executed only when batch downloading and one camera is connected.
Switching to the segment being reserved or saving cannot be performed.

USB 3.0 Download

By connecting the camera (ACS, GO series) compatible with USB 3.0 download with the PC with the USB 3.0 compatible cable, downloading can be performed at high speed.

For USB 3.0 download, a corresponding driver must be installed on the PC.
(Refer to p.23)

By selecting USB 3.0 from the download setting panel, all downloads of USB 3.0 compatible models are executed via USB 3.0 for USB 3.0 download settings.

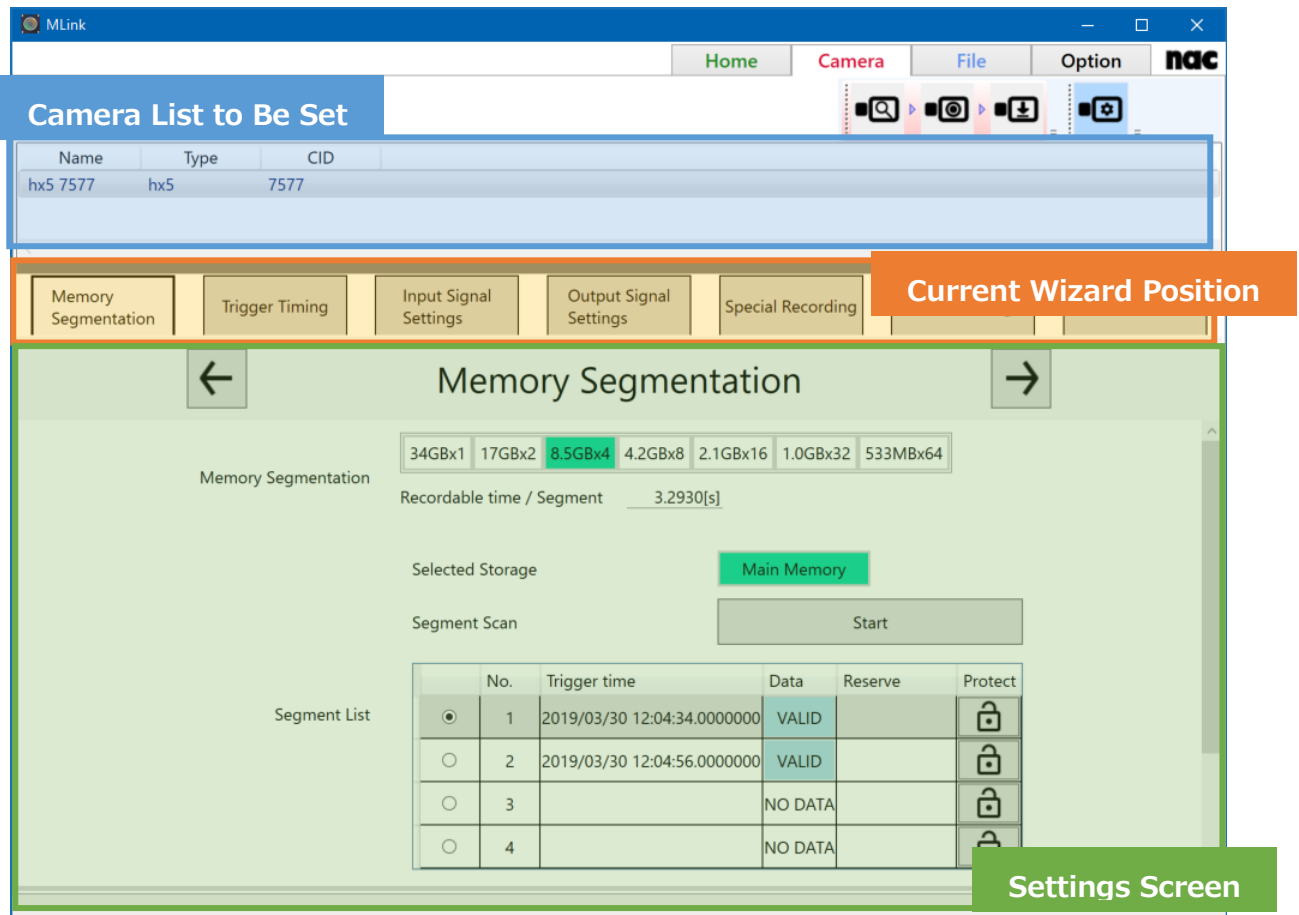


| Set Value | Description |
|-----------|--|
| Ethernet | It is a download using the Ethernet cable. |
| USB3.0 | It is a download using USB 3.0. |

4.1.4 Photographing Menu

The Photographing Menu has the settings determined by the filming environment (method of camera placement or the method for inputting/outputting signals to the camera and recording). Basically, if the application settings are set once at the beginning, there is no need to set them each time for subsequent recording.

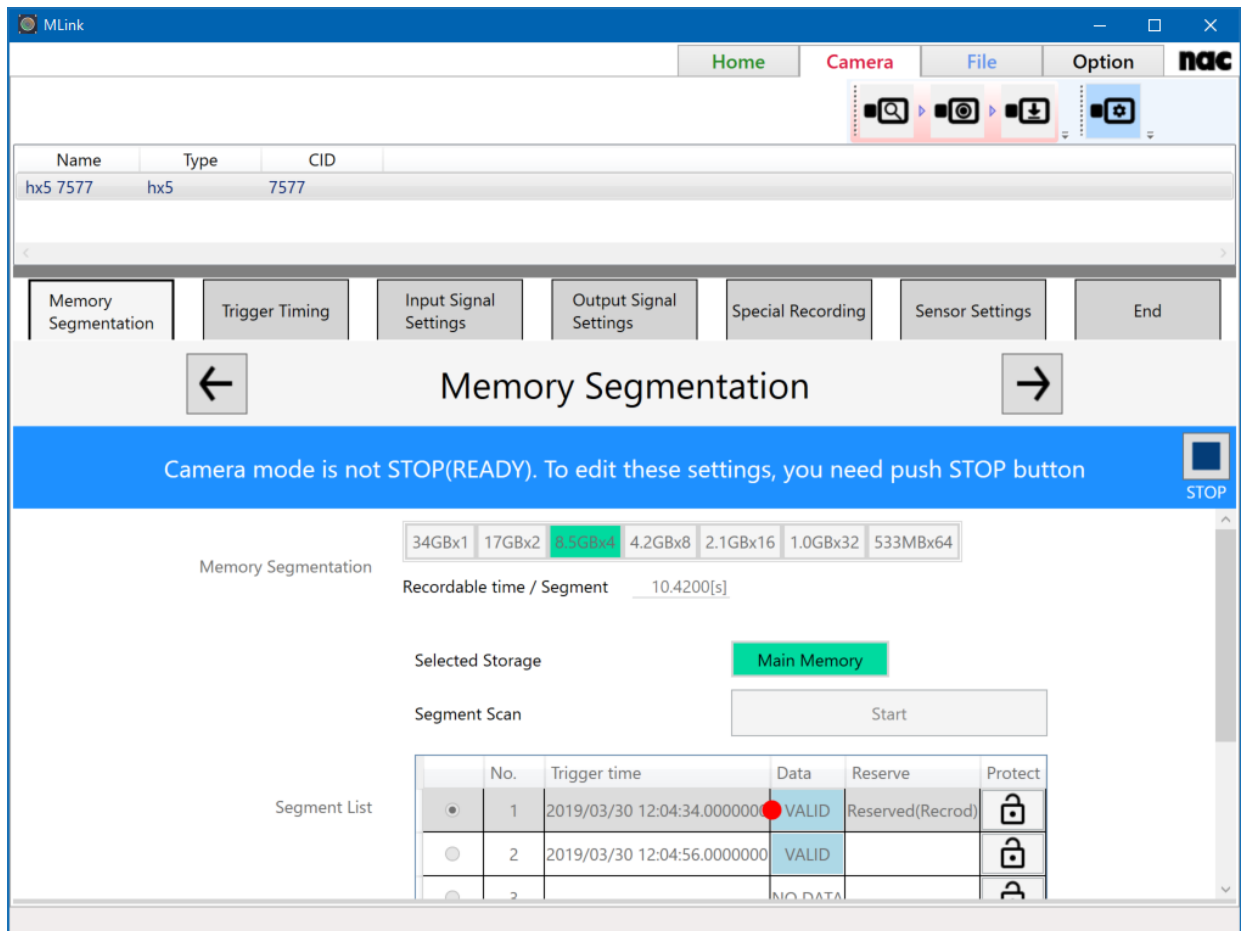
The settings screen is in the wizard format.



Click "Next" to transition to the next settings screen. If the page to be set is selected with the current wizard position, that settings screen can be directly displayed.

If any camera task tool bar is selected while setting, the application settings can be avoided. Operation of these basic setting screens is the same for any Photographing Menu mode. All of the items that can be set on the camera can be set on the Photographing Menu without any restrictions.

If the Photographing Menu is shown while the camera is in the VIEW mode, the following view stop buttons appear.



Since there are many items that cannot be set on the Photographing Menu while the camera is in the VIEW mode, make changes to the Photographing Menu by ending VIEW using the stop button.

The Photographing Menu includes the following.

- Segment Division
- Trigger Timing
- Input Settings
- Output Settings
- Special Filming Settings
- Sensor Settings

Segment Division

Use by dividing the camera recording memory. The recording time for divided memory segments is shortened according to the number of divisions but different scenes can be recorded on the divided memory parts.

Memory Segmentation

Memory Segmentation

Recordable time / Segment 0.1970[s]

Selected Storage Main Memory Internal Storage

Segment Scan Start

4.0GBx1 2.0GBx2 1.0GBx4 511MBx8 255MBx16

Segment List

| | No. | Trigger time | Data | Reserve | Protect |
|----------------------------------|-----|-----------------------------|---------|---------|---------|
| <input type="radio"/> | 1 | 2019/03/30 14:11:05.4024930 | VALID | | |
| <input checked="" type="radio"/> | 2 | 2019/03/30 14:11:18.3391760 | VALID | | |
| <input type="radio"/> | 3 | | NO DATA | | |
| <input type="radio"/> | 4 | | NO DATA | | |

Memory clear 1 memory clear All memory clear

Automatically save to internal storage. OFF AUTO LOOP

The current number of divided segments is shown in green. To divide memory segments, click the divide segments button for a number other than the current number of segments. The “Size per Segment”, “Recordable Time per Segment” and “Segment List” are updated according to the number of divided segments.

When dividing segments, image data recorded in the camera memory is lost. If there is required data remaining, make sure to download the image data before performing segment division.

Selected Storage

| | |
|---|-------------|
| Switch the storage destination of the recorded data | Description |
|---|-------------|

| recorded in the camera.State | |
|------------------------------------|--|
| Main Memory | Basic data recording destination. For cameras without internal storage, only main memory is displayed. |
| Internal Storage (MX Only) | Refers to data recorded in internal storage. Recording is not possible while internal storage is selected |

Segment Scan

Check the data existence of each segment. If the camera reconnects after recording, or if the storage is switched, only the data of the current segment is displayed, so a scan needs to be performed to check if all segments have data.

Segment List

Recording data will be saved for the segments marked in the leftmost column. If it has already been saved, the recorded data saved in that segment will be played back. The presence or absence of recording data is displayed on the trigger time and segment status.

| Data | Description |
|---------|---|
| NO DATA | Indicates that there is no recording data in the segment. |
| VALID | Indicates that there is recording data in the segment. The trigger input time of recording data is displayed in the trigger time column. |

Reserve

A reservation indicates a state in which access to the segment is restricted in order to execute recording or saving from now on. Only HX and ACS cameras are supported. There are the following three reservations.

| State | Description |
|--------------------|---|
| Reserved(Record) | Segment switching is restricted to execute the recording trigger mode AUTO. |
| Reserved(Download) | Access to the segment is restricted to perform the download. |
| Reserved(USB) | Access to the segment is restricted in order to perform USB storage. |

Reservation will be canceled automatically when recording is completed or after saving is



completed.

Protect

HX cameras and ACS cameras can prevent overwriting by using segment protection.

Protected segments will be impossible to ARM after recording.

Switching segment protection is switched by clicking the icon.

| Icon | Description |
|---|----------------------------------|
|  | Invalid segment protection |
|  | Segment protection is effective. |

Memory clear

It is a data leak prevention function. Deletes the storage data of the selected storage.

1 memory clear

Erases the current segment data.

All memory clear

Erase all data in the recording memory.

Automatically save to internal storage

For cameras compatible with internal storage, data can be written to internal storage after recording is complete. The destination number is automatically determined by the camera.

| State | Description |
|-------|--|
| OFF | Does not save automatically. |
| AUTO | It will automatically save until the internal storage is full. |
| LOOP | Always save automatically. If the internal storage becomes full, it will go back to the top and overwrite. |

Copy main memory's data to internal storage

For cameras compatible with internal storage, you can save selected segment manually to internal storage. Click “Open setting window”.

←
→

Memory Segmentation

Memory Segmentation

Recordable time / Segment 1.1870[s]

137GBx1
68GBx2
34GBx4
17GBx8
8.5GBx16
4.2GBx32
2.1GBx64

Selected Storage

Segment Scan

Copy main memory's data to internal storage

Main Memory
Internal Storage

Start
Open setting window

| | No. | Trigger time | Data | Reserve | Protect |
|----------------------------------|-----|------------------------------|---------|---------|---------|
| <input checked="" type="radio"/> | 1 | 2020/01/24 10:35:44.97082000 | VALID | | 🔒 |
| <input type="radio"/> | 2 | | NO DATA | | 🔒 |
| <input type="radio"/> | 3 | | NO DATA | | 🔒 |

The following window appears. To select segment that you want to copy and click “Copy selected segment to SSD”, you can save to internal storage.

Copy main memory's data to internal storage
✖

RAM

Select the segment(s) to copy.

| <input type="checkbox"/> | No. | Trigger time | Data |
|--------------------------|-----|------------------------------|-------|
| <input type="checkbox"/> | 1 | 2020/01/24 10:35:44.97082000 | VALID |

SSD

Delete all data in SSD

free space 487.000[GB] / 500.000[GB] vacant segment 246/255

| No. | Trigger time | Data |
|-----|-------------------------------|-------|
| 1 | 2020/01/22 19:30:56.005742000 | VALID |
| 2 | 2020/01/22 21:51:51.729134600 | VALID |
| 3 | 2020/01/23 10:42:56.488029100 | VALID |
| 4 | 2020/01/23 13:35:13.709823700 | VALID |
| 5 | 2020/01/23 13:35:13.709823700 | VALID |
| 6 | 2020/01/23 13:46:27.607518700 | VALID |
| 7 | 2020/01/23 13:46:27.607518700 | VALID |
| 8 | 2020/01/23 13:35:13.709823700 | VALID |
| 9 | 2020/01/24 10:35:44.970820000 | VALID |

Copy selected segment to SSD

Cancel

Also, to click “Delete all data in SSD”, you can delete all data in internal storage. You can't delete segment data individually.

Trigger Timing

Settings related to trigger signals.

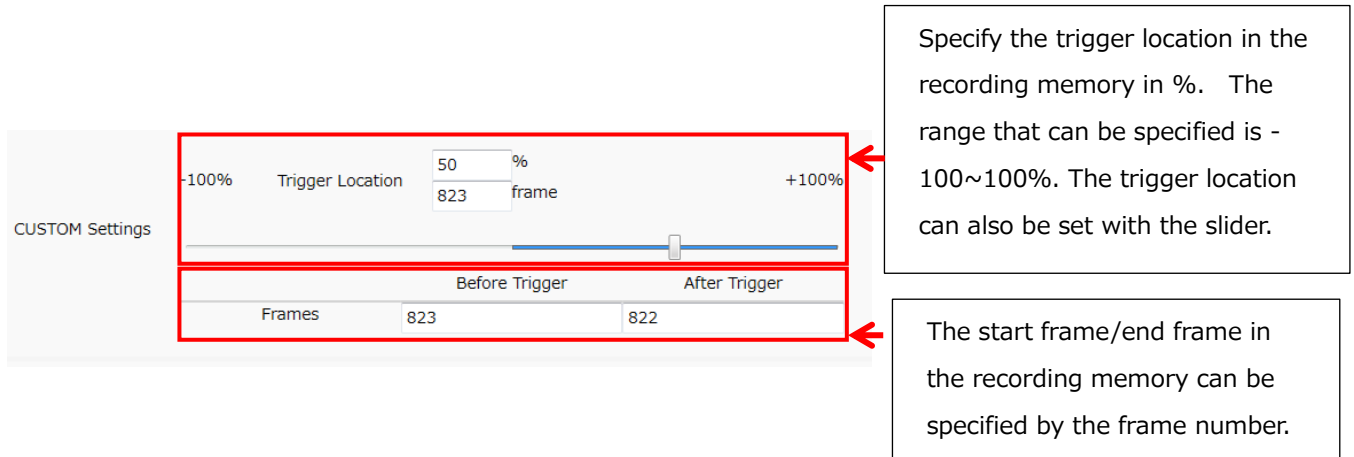
Trigger Timing

Set the recording trigger position. If the recording trigger mode is BURST, MULTI1~3 or LINEAR, these settings are not valid.

| Function | Description |
|----------|---|
| Start | The trigger frame is the frame about 5% from the beginning of the recording memory. |
| Center | The trigger frame is at the center (about 50%) of the recording memory. |
| End | The trigger frame is the frame about 5% from the end of the recording memory. |
| Custom | The trigger frame is a numerical frame (corresponding to -100 ~ 100%) that is a custom setting. |

Custom Settings for Trigger Timing

Select Custom and the details for custom trigger timing are shown so the trigger timing can be set exactly.



CUSTOM Settings

Trigger Location: 50 % (range: -100% to +100%)
823 frame

| | Before Trigger | After Trigger |
|--------|----------------|---------------|
| Frames | 823 | 822 |

Specify the trigger location in the recording memory in %. The range that can be specified is -100~100%. The trigger location can also be set with the slider.

The start frame/end frame in the recording memory can be specified by the frame number.

G-Sensor Trigger ☒ OFF ☐ ON

G-Sensor Threshold G

G Trigger

Setting that uses the G sensor on the MX cameras to detect the trigger. If ON, in addition to normal trigger input, the trigger is send by impact with the camera itself.

G Trigger Threshold Value

Designate the threshold value for the G trigger detection. The units are [G] (acceleration).

Input Settings

Individually set the items relating to input.

←

Input Signal Settings

→

External Trigger

TRIG1

TRIG2

ANY

BOTH

Trigger Detection

Signal Edge

Signal Level

TRIG1 Input

Nega

Posi

TRIG2 Input

Current OFF

Current ON

Set TRIG2 Filter as the same value as TRIG1

OFF

ON

TRIG1 Filter

[us]

TRIG2 Filter

[us]

Trigger Selection

Select the connector where the external trigger signals are input.

| Function | Description |
|----------|--|
| TRIG1 | Select when inputting trigger signals to the TRIG1 connector. |
| TRIG2 | Select when inputting trigger signals to the TRIG2 connector. Select when using the GX-HUB trigger connector. |
| ANY | Select when inputting trigger signals to either the TRIG1 or TRIG 2 connector. Item only for the HX and GX-8 cameras. |
| BOTH | Select when inputting trigger signals to both the TRIG1 and TRIG 2 connectors and if both signals are simultaneously ON, the trigger is recognized. Item only for the HX and GX-8 cameras. |

Trigger Detection Method

| Detection Conditions | Description |
|----------------------|--|
| Signal Edge | Recognizes the trigger if the trigger signal is enabled. |
| Signal Level | Recognizes the trigger if the trigger signal changes from disabled to enabled. |

TRIG1 Input

Select the polarity of the external trigger signal (Contact TTL level). If TRIG1 is not used, select "Negative Polarity".

TRIG2 Input

Select the polarity of the external trigger signal (current loop). If TRIG2 is not used, select "Current ON".

Making the TRIG2 Filter and TRIG1 Filter Values the Same

Make the TRIG2 filter setting the same as the TRIG1 filter setting.

TRIG1 Filter

Specify the external trigger signal noise filter effect to TRIG1 in units of microseconds.

TRIG2 Filter

Specify the external trigger signal noise filter effect to TRIG2 in units of microseconds.

| | | |
|--|--|---|
| EST Input (Synchronization Signal) | <input checked="" type="checkbox"/> EST1 | <input type="checkbox"/> EST2 |
| Set EST2 Filter as the same value as EST1 | <input type="checkbox"/> OFF | <input checked="" type="checkbox"/> ON |
| EST1 | <input checked="" type="checkbox"/> Nega | <input type="checkbox"/> Posi |
| EST2 | <input checked="" type="checkbox"/> Nega | <input type="checkbox"/> Posi |
| EST1 Filter | <input type="text" value="0.0"/> [us] | |
| EST2 Filter | <input type="text" value="0.0"/> [us] | |
| When EST recording, update live image sync with EST signal(EST VIEW sync) | <input type="checkbox"/> OFF(Internal) | <input checked="" type="checkbox"/> ON(EST/A-EST) |

EST Selection

Select the external synchronization signal used from EST1/EST2.

| Connector | Description |
|-----------|--|
| EST1 | Select when inputting synchronization signals to the EST1 connector. |
| EST2 | Select when either inputting synchronization signals to the EST2 connector or inputting synchronization signals to the GX-HUB EST IN connector that connects the camera to the GX-HUB. |

Making the EST2 Filter and EST1 Filter Values the Same

Make the EST2 filter setting the same as the EST1 filter setting

EST1

Select the polarity of the external synchronization signal.

EST2

Select the polarity of the external synchronization signal.

EST1 Filter

Specify the external trigger signal noise filter effect to EST1 in units of microseconds.

EST2 Filter

Specify the external trigger signal noise filter effect to EST2 in units of microseconds.

Synchronize to EST Signals During EST Recording and Update VIEW

(EST VIEW Synchronization)

Synchronization setting during VIEW for EST recording.

| Synchronization Setting | Description |
|-----------------------------------|---|
| OFF (Internal Synchronization) | Select when the image is displayed with internal synchronization signals, such as when the EST signals are not input to the HX, GX or Q cameras when in VIEW. |
| ON (EST/A-EST) | Select when displaying images synchronized to EST signals during VIEW. |

ARM Command Input

Nega

Posi

ARM Command Input

Select the ARM command signal polarity input to the camera.
Select “Negative Polarity” if the ARM command is not used.

SYNC-In

Select the following sync signal input method.
EST: Input the exposure start signal.
IRIG: Input the time sync signal.

SYNC-In

NONE

IRIG

EST

Output Settings

Individually set the items relating to output.

←

Output Signal Settings

→

EPO Output
(Exposure Pulse)

Nega

Posi

VD Out Polarity

Nega

Posi

VD Out Delay

0.0

us

VD OUT Frequency

40

[Hz]

Frequency Ratio :

4

x4

If you want to specify "1/n" to VD OUT frequency ratio, please input "-n".
And you can specify preset value from combo box.

EPO Output (Exposure Pulse)

Select the polarity of the exposure pulse output by the camera.

VD Out Polarity

Select the polarity of the synchronization signal generated the camera.
ACS and GO are supported.

VD Out Delay

Adjust the output timing of the sync signal generated the camera.ACS and GO are supported.

VD Out Frequency

Adjust the frequency of the synchronization signal based on the camera frame rate. ACS and GO are supported.To set the VD OUT frequency ratio to 1/n, enter -n to the textbox. You can also select the ratio from pull-down list.

| | | | |
|---------------------|---|-------------------------------|-----------------------------|
| Trigger Output Mode | <input checked="" type="radio"/> STATUS | <input type="radio"/> TRIGOUT | |
| Trigger Output | <input checked="" type="radio"/> Nega | <input type="radio"/> Posi | |
| TRIG OUT Timing | <input checked="" type="radio"/> CENTER | <input type="radio"/> THROUGH | <input type="radio"/> DELAY |
| TRIG OUT Delay | <input type="text" value="0.0"/> us | | |

Trigger Output Mode

Select trigger output signal.

| Set Value | Description |
|-----------|---|
| STATUS | A state indicating that a recording trigger has been input is output. |
| TRIGOUT | Output the recording trigger output to the camera or other equipment. |

Trigger Output

Select the polarity of the signal to be output to the trigger output pin.

TRIG OUT Timing

Change the output timing of TRIG OUT.

It becomes the function of ACS and GO.

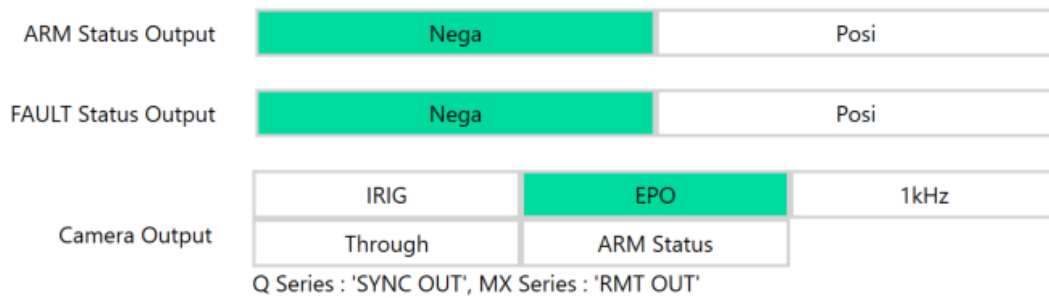
| Set Value | Description |
|-----------|--|
| CENTER | It outputs at the center of the exposure time of the next frame. |
| THROUGH | It outputs at the same time it receives the trigger. |
| DELAY | After the exposure of the next frame starts, it is output at the |

| | |
|--|-------------------|
| | specified timing. |
|--|-------------------|

TRIG OUT Delay

TRIG OUT Timing Change the value of DELAY.

It becomes the function of ACS only.



ARM Status Output Polarity

Select the polarity of the ARM status signals output by the camera.

FAULT Status Output Polarity

Select the polarity of the FAULT status signals output by the camera.

Camera Output

Select the signal output from SYNC OUT for Q camera and RMT OUT for MX series.

| Output | Description |
|------------|--|
| EPO | Outputs the exposure pulse. |
| IRIG | Outputs the IRIG-B signals. |
| 1kHz | Outputs the 1kHz signals. |
| Through | Outputs SYNC IN signals from SYNC OUT. |
| ARM Status | Outputs the ARM status signals. |

| | | | | |
|-------------------|--------|--------|---------|-------|
| DIO General IN | ARMCMD | | | |
| DIO General OUT 1 | FAULT | ARMSTS | TRIGOUT | VDOUT |
| DIO General OUT 2 | FAULT | ARMSTS | TRIGOUT | VDOUT |
| DIO General OUT 3 | FAULT | ARMSTS | TRIGOUT | VDOUT |

DIO General

Select the ACS I / O connector setting.

| Input | Description |
|--------|--|
| ARMCMD | When a signal is input, it switches to ARM mode. |

| Output | Description |
|---------|-------------------------------|
| FAULT | FAULT Status is output. |
| ARMSTS | ARM Status is output. |
| TRIGOUT | The trigger signal is output. |

SYNC-OUT

Select the output method of the following sync signals.

EPO: Outputs the exposure pulse signal.

IRIG-DCLS: Outputs the time sync signal.

TRIG OUT: Outputs the trigger signal.

VDOUT: Outputs the sync signal generated inside the camera.

| | | |
|----------|---------|-------|
| SYNC-OUT | IRIG | EPO |
| | TRIGOUT | VDOUT |

Special Filming Settings

Recording Trigger Mode

Sets the recording trigger mode.

Special Recording

MULTI(A)

Memory Segment Shift : None

Recording Trigger Mode

Multiple Memory Blocks : Enable

Block Shift : Keep recording until last block.
(All Blocks)

| | | Blocks | Max Number of Blocks | Frames Before Trigger | Frames After Trigger |
|-----------------------------------|--------|--------|-------------------------|--------------------------|-------------------------|
| Settings of MULTI Trigger Mode | MULTI | 2 | | X | X |
| | MULTI1 | X | 1647 | X | 1 |
| | MULTI2 | X | 64 | 0 | 1 |
| | MULTI3 | X | 823 | X | 1 |

The recording trigger modes that can be set are as follows. These 7 recording trigger modes cannot be used in combination.

| Set Value | | Description |
|------------------|------------|---|
| NORMAL Recording | NORMAL | Normal recording |
| | NORMAL (A) | Normal recording AUTO mode. |
| | NORMAL (L) | Normal recording LOOP mode. |
| Event Recording | EVENT | When multiple external trigger signals are input during recording, the first external trigger signal is treated as the original trigger signal, and the 2 nd and subsequent external trigger signals are recorded as an event. |
| | EVENT (A) | Event recording AUTO mode. |
| | EVENT (L) | Event recording LOOP mode. |
| Burst Recording | BURST | Method of recording only during the time that external trigger signals are input. |
| | BURST (A) | Burst recording AUTO mode. |
| | BURST (L) | Burst recording LOOP mode. |

| | | |
|-------------------------|------------|---|
| Multi-trigger Recording | MULTI (A) | Splits the selected memory segments into 2~64 blocks, automatically switches the blocks at each trigger signal input and records. "All Blocks" mode that ends recording at the trigger signal input for the number of blocks. |
| | MULTI (C) | "Continuous" mode that repeatedly records until "Stop" in the MULTI-recording method is clicked. |
| | MULTIS (A) | AUTO mode for the MULTI-recording method |
| | MULTIS (L) | LOOP mode for the MULTI-recording method |
| Multi-manual Recording | MULTI1 (A) | Recording method that records the specified frame number selected each time a trigger is detected. The exposure start time is synchronized with the trigger signal. Automatic block switching in the "All Blocks" mode. |
| | MULTI1 (C) | "Continuous" mode that repeatedly records until "Stop" in the MULTI-recording method is clicked. |
| | MULTI2 (A) | A recording method identical to multi-trigger recording where the block sizes are specified by the frame number. The exposure timing follows the camera synchronization settings. Automatic block switching in the "All Blocks" mode. |
| | MULTI2 (C) | "Continuous" mode that repeatedly records until "Stop" in the MULTI2-recording method is clicked. |
| | MULTI3 (A) | The same as MULTI1 that is a recording method that records the specified frame number selected each time a trigger is detected. The exposure start time is synchronized with the trigger signal. Automatic block switching in the "All Blocks" mode. |
| | MULTI3 (C) | "Continuous" mode that repeatedly records until "Stop" in the MULTI3-recording method is clicked. |
| Linear Recording | LINEAR | Mode where after switching to record (standby), it automatically switches during recording. Records until Stop is pressed or until the end of the segment is reached. Recording can also be paused with the trigger button. Restart recording by clicking on Record while paused. Function available only on HX, ACS cameras. |
| DUAL Recording | DUAL | Recording method where two segments are used to perform high speed and low speed recording simultaneously. |

AUTO Mode

Mode that automatically switches segments and repeatedly records. In the “AUTO” mode, if switched segments have finished recording, recording of those segments is not possible. The end conditions for automatically switching segments and starting recording are when the current segment is the final segment and when recording has failed in the memory protect function.

LOOP Mode

Mode that automatically switches segments and repeatedly records. In the “LOOP” mode, recording occurs even when switched segments have finished recording. The end conditions for automatically switching segments and starting recording are when “Stop” has been clicked.

The recording trigger modes that can be set varies according to the camera used. Also, do not set in modes other than the recording trigger modes that can be set.

If using multi-trigger recording, set the number of block divisions with “Specify Number of Blocks”.

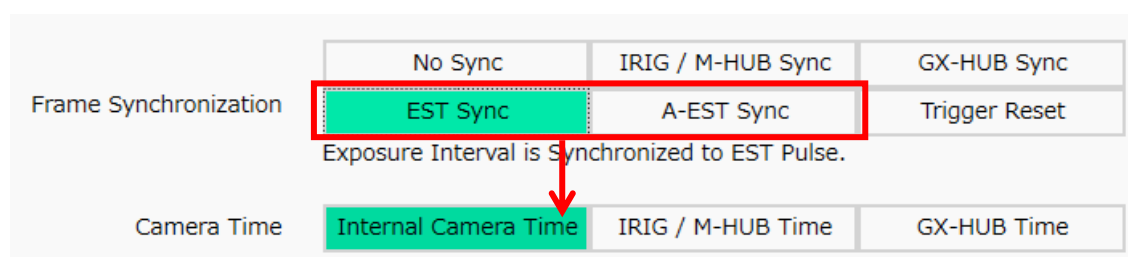
| Settings of MULTI Trigger Mode | Blocks | | Max Number of Blocks | Frames Before Trigger | Frames After Trigger |
|-----------------------------------|--------|---|-------------------------|--------------------------|-------------------------|
| | MULTI | | | | |
| | MULTI1 | X | | X | 100 |
| | MULTI2 | X | | 0 | 100 |
| | MULTI3 | X | | X | 100 |

With multi-manual recording, make the settings for the number of recording frames before and after the trigger using “Range Before Trigger” and “Range After Trigger”. The settings are made by directly inputting the number of recording frames into the input column.

| Settings of MULTI Trigger Mode | Blocks | | Max Number of Blocks | Frames Before Trigger | Frames After Trigger |
|-----------------------------------|--------|---|-------------------------|--------------------------|-------------------------|
| | MULTI | | | | |
| | MULTI1 | X | | X | 100 |
| | MULTI2 | X | | 0 | 100 |
| | MULTI3 | X | | X | 100 |

Frame Synchronization

Select the camera time or the synchronization signal to set synchronization.



Items that can be set are as follows.

| Function | Description |
|---------------------------------------|---|
| No synchronization (Internal time) | Used for independent camera operation or when there is no need for precise time synchronization. The standard for the camera internal time is the exposure cycle of the camera. |
| IRIG/M-HUB time synchronization | Photograph with the camera synchronized to the IRIG-B signals or the M-HUB posted time. |
| GX-HUB time synchronization | Photograph with the camera synchronized to the GX-HUB posted time. |
| EST synchronization | Photograph with the camera synchronized to the external synchronization signals. |
| A-EST synchronization | Photograph with the camera synchronized to the external synchronization signals. Since the exposure time requires signal timing of $\frac{1}{2}$ or less, synchronization with greater accuracy than EST synchronization is possible. |
| Reset trigger | Reset the exposure cycle to match the instant of trigger input. Once reset, the internal time of the camera becomes the standard after the reset. |

With synchronization settings, if EST synchronization or A-EST synchronization is selected, the items set with "Standard Camera Time" are shown. The exposure timing is dependent on the external signals so the recorded time becomes the time selected here.

Variable Frame Rate Recording

It is possible to change the frame rate of the ACS, HX and GX-8 camera during recording.

| | | |
|------------------------------|---|---|
| Variable Frame Rate | <input checked="" type="checkbox"/> OFF <input type="checkbox"/> ON | |
| Frame Rate in Low Speed Part | Low = High / | <input type="text" value="2"/> |
| Range of High Speed Part | Trigger Input to | <input type="text" value="409"/> frames |

Slow Recording Settings

Input slow recording speeds when the Variable Recording Frame Rate Function is ON.

Set at a ratio of the current frame rate.

Range for Normal Recording

The range for normal recording is specified by recording a high frame rate several frames from the trigger input or by the number of frames.

Frame Straddling (for PIV filming)

Turns the frame straddling function ON/OFF. This function is only enabled on the HX, GX-8 and ACS cameras.

| | | |
|---|---|---|
| Frame Straddling (For PIV measurement) | <input checked="" type="checkbox"/> OFF <input type="checkbox"/> ON | |
| Live Display in Frame Straddling | <input checked="" type="radio"/> 1st Frame | <input type="radio"/> 2nd Frame <input type="radio"/> ANY |

VIEW during Frame Straddling

The video and image display method when using the frame straddling function.

| Function | Description |
|----------|--|
| ANY | Displays the latest image without differentiating between the 1 st frame and the 2 nd frame of the frame straddling image. |
| 1st | Displays only the 1 st frame of the frame straddling image. |
| 2nd | Displays only the 2 nd frame of the frame straddling image. |

Sensor Settings

Settings relating to the pixel bit or exposure timing sensor function.

| Sensor Settings | |
|--------------------|---|
| Frame Rate | 1000 |
| Recording Priority | <div>Image Quality</div> <div>Sensitivity</div> |
| Pixel Bit Depth | <div>8bit</div> <div>10bit</div> <div>12bit</div> |
| Exposure Timing | <div>At Exposure Start (GX Native)</div> <div>At Exposure End (K4 Compatible)</div> |

Frame Rate

Shows the recording frame rate of the camera.

Recording Priority

Sets the recording priority.

Pixel Bit Length

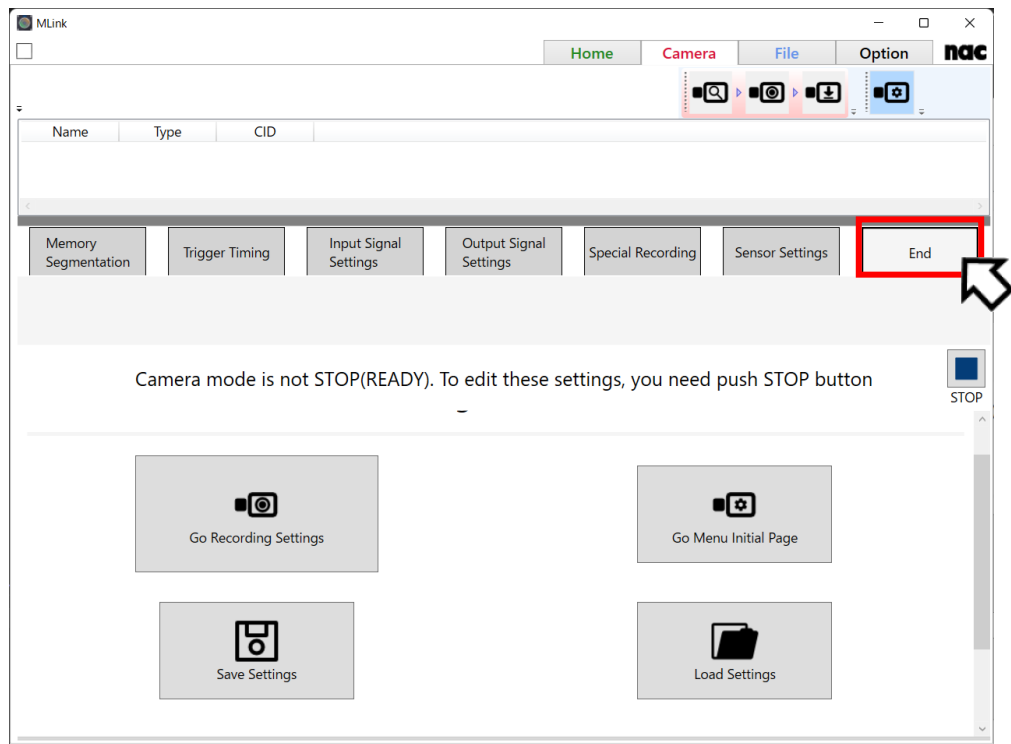
Sets the pixel bit length.

Exposure Timing

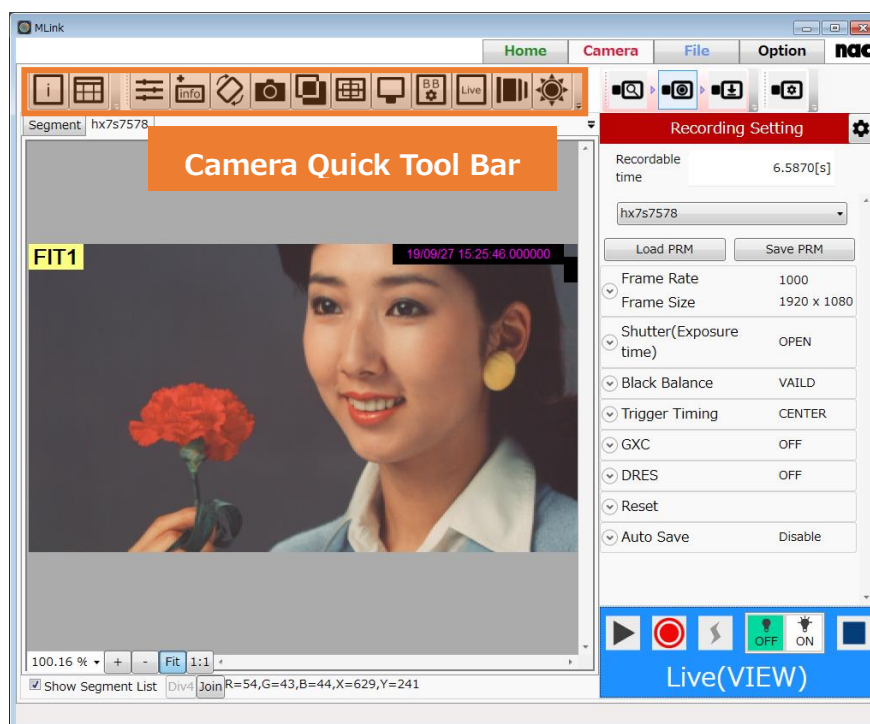
Set the exposure timing of the HX · GX · Q · ACS · GO cameras to either coordinate with the start or end of the synchronization signals.

| Function | Description |
|---|---|
| Set the exposure start (GX native) | Start exposure at the start of the synchronization signals. |
| Set the exposure end (K4 conversion) | Start exposure at the end of the synchronization signals. |

The settings of each item in the shooting menu can be saved as an INI file upon "End."
As long as the camera is connected, the saved INI file can be loaded into the camera at the appropriate timing by clicking "End" in the same way as when saving.



4.1.5 Items that Can Be Set from the Camera Quick Tool Bar



The following can be set from the camera quick tool bar. (From the left icon)

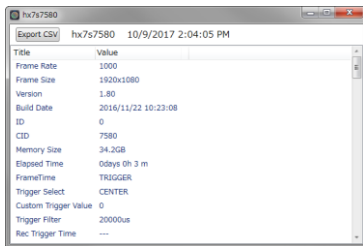
- **Show properties**
- **Camera Setting Table**
- **Image Quality Adjustment**
- **Superimpose**
- **Image Rotation and Inversion**
- **Snapshot**
- **Image Overlay**
- **Frame Size Details**
- **Monitor Settings**
- **Black Balance Settings**
- **Live Settings**
- **Lens control**
- **Image Trigger (Brightness Detection Trigger)**
- **Fan Stop**
- **HDR Settings**

- Exposure Setting
- Simple measurement

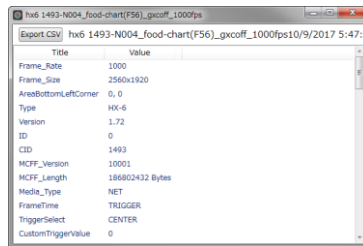
Show properties



Display property information of the item.



Camera properties



MCFF properties

To output the contents of the property to the CSV file, do the following operations.

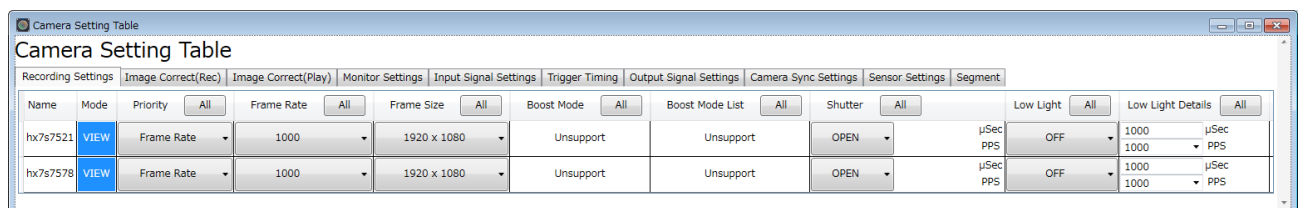
1. Click the button.
2. As the "Save As" window appears, select the save destination folder, enter the file name, and press the "Save" button.

Camera Setting Table



If you are connected to multiple cameras, you can check and set the parameters of all the cameras in the "Camera Setting Table" window.

"Camera Setting Table" Window.

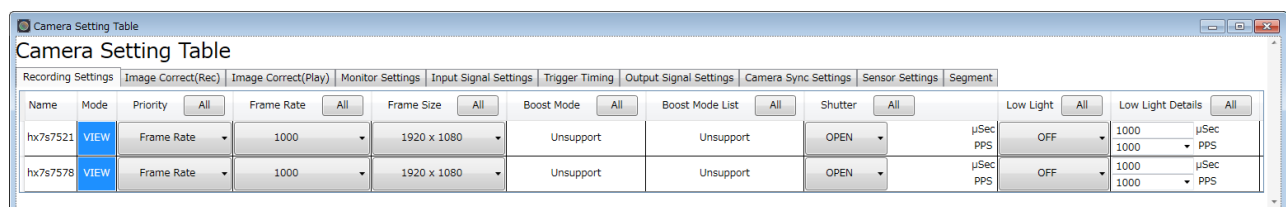


The " Camera Setting Table " window opens by clicking button of "camera quick tool bar".

- **Recording Settings** Camera recording settings
- **Image Correct(Rec)** Setting the image quality for shooting
- **Image Correct(Play)** Setting of image quality of image recorded in memory
- **Monitor Settings** Setting items displayed on the video monitor or viewfinder
- **Input Signal Settings** Settings related to input signals such as EST input
- **Trigger Timing** Setting items related to the trigger signal
- **Output Signal Settings** Settings related to output signals such as ARM status output
- **Camera Sync Settings** Synchronous shooting settings
- **Sensor settings** Settings related to sensor function
- **Segment** Settings related to segment

You can change the setting by clicking the cell of the parameter to be set. If you set the parameter on the top "Batch" line, the parameters are set for all cameras.

Recording Settings



Recording Settings (HX camera connection)

Item of "Recording setting"

Priority

Frame Rate Recording frame rate (pps)

Frame Size Recording frame size

Boost Mode Boost mode ON / OFF can be set.

Boost Mode List Select from candidates of frame rate and frame size for boost mode

Shutter Shutter speed (exposure time) can be set

- Low Light

Low light ON / OFF can be set
- Low Light Detail

The brightness of low light can be set

Image Correct(Rec)

| Camera Setting Table | | | | | | | | | | | | | |
|---|------|--------|-----|------|-----|-------|-----|------|-----|---------|--------|---------------|-----------------------|
| Camera Setting Table | | | | | | | | | | | | | |
| Recording Settings Image Correct(Rec) Image Correct(Play) Monitor Settings Input Signal Settings Trigger Timing Output Signal Settings Camera Sync Settings Sensor Settings | | | | | | | | | | | | | |
| Name | Mode | Lut | All | Gain | All | Gamma | All | Knee | All | Enhance | Chroma | White Balance | RGB Matrix Correction |
| hx5 7577 | VIEW | NORMAL | | MID | | MID | | ON | | MID | 100 | Auto | OFF |
| hx7s7578 | VIEW | NORMAL | | MID | | MID | | ON | | LOW | 100 | Auto | OFF |

Image Correct (Rec) (HX camera connection)

Items that can be set with "Image Quality Adjustment (Rec)" are the same as the items on Image Quality Adjustment (⇒ page 90) of the Camera Quick Tool Bar.

Image Correct(Play)

| Camera Setting Table | | | | | | | | | | | | | |
|---|------|--------|-----|------|-----|-------|-----|------|-----|---------|--------|---------------|-----------------------|
| Camera Setting Table | | | | | | | | | | | | | |
| Recording Settings Image Correct(Rec) Image Correct(Play) Monitor Settings Input Signal Settings Trigger Timing Output Signal Settings Camera Sync Settings Sensor Settings | | | | | | | | | | | | | |
| Name | Mode | Lut | All | Gain | All | Gamma | All | Knee | All | Enhance | Chroma | White Balance | RGB Matrix Correction |
| hx5 7577 | VIEW | NORMAL | | MID | | MID | | ON | | MID | 100 | Auto | OFF |
| hx7s7578 | VIEW | NORMAL | | MID | | MID | | ON | | LOW | 100 | Auto | OFF |

Image Quality (Play) (HX camera connection)

Items that can be set with "Image Quality Adjustment (Play)" are the same as the items on Image Quality Adjustment (⇒ page 90) of the Camera Quick Tool Bar.

Monitor Settings

| Camera Setting Table | | | | | | | | | | | | | |
|---|-------|------|-------------|------------------|--------------------|--|--|--|--|--|--|--|--|
| Camera Setting Table | | | | | | | | | | | | | |
| Recording Settings Image Correct(Rec) Image Correct(Play) Monitor Settings Input Signal Settings Trigger Timing Output Signal Settings Camera Sync Settings Sensor Settings | | | | | | | | | | | | | |
| Name | Mode | Zoom | OSD Display | OSD Display Mode | Frame Time Display | | | | | | | | |
| hx5 7577 | READY | FIT1 | All | Always | Frame | | | | | | | | |
| hx7s7578 | READY | FIT1 | All | Always | Frame | | | | | | | | |

Monitor Settings (HX camera connection)

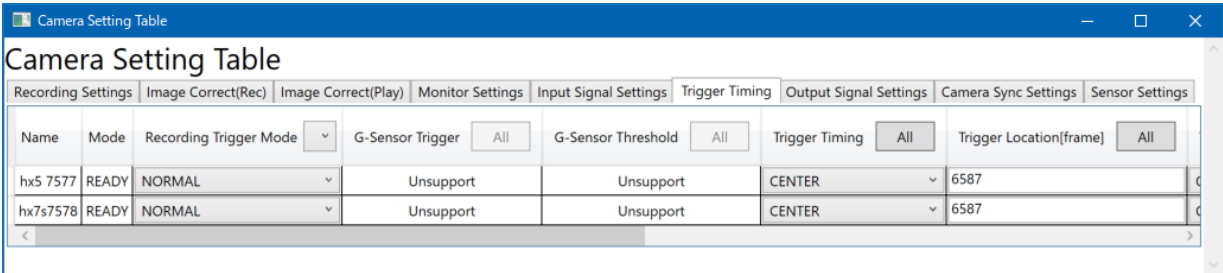
Detection

ARM Command Select ARM command signal polarity input to camera.

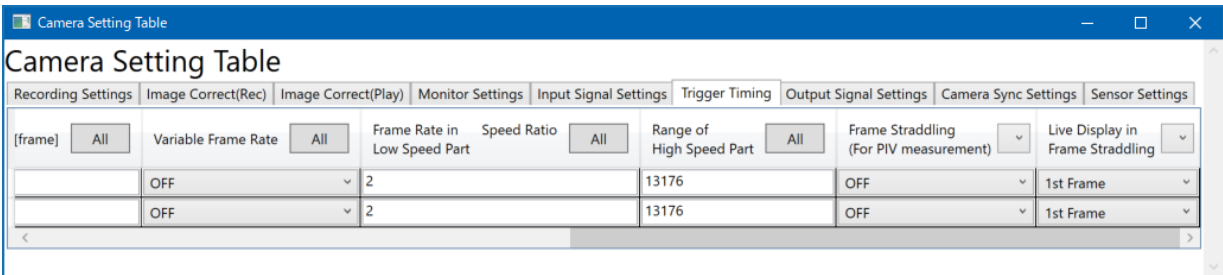
Input

Sync-In Select the sync input signal.

Trigger Timing



Trigger setting (HX camera connection) 1



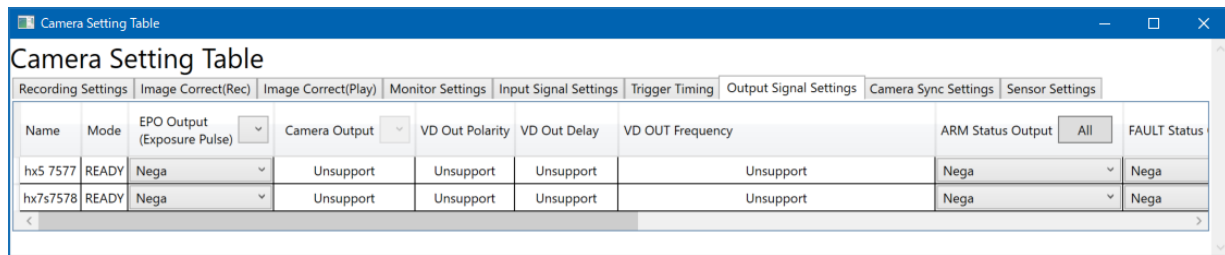
Trigger setting (HX camera connection) 2

Item of "Trigger setting"

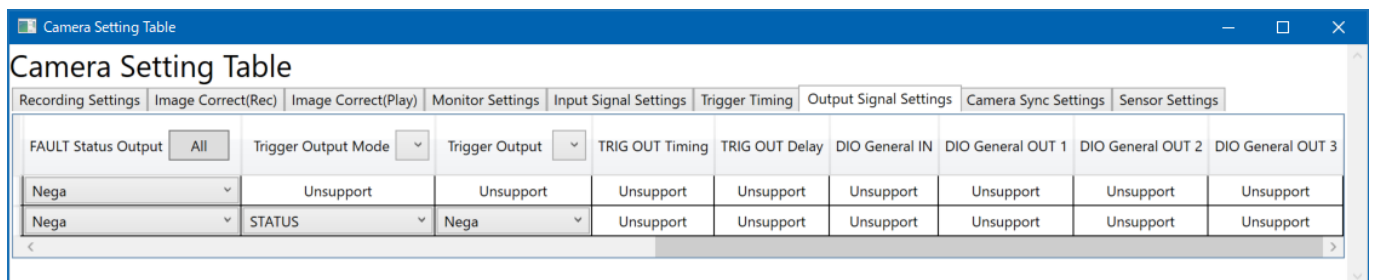
| | | |
|---------------------|---------------------------------|---|
| Recording | Set the recording trigger mode. | |
| Trigger Mode | NORMAL | NORMAL recording |
| | NORMAL(A) | AUTO mode of normal recording |
| | NORMAL(L) | LOOP mode of normal recording |
| | EVENT | Record external trigger signal during recording |
| | EVENT(A) | AUTO mode of event recording |
| | EVENT(L) | LOOP mode of event recording |
| | BURST | Record only when external trigger signal is input |
| | BURST(A) | AUTO mode of burst recording method |
| | BURST(L) | LOOP mode of burst recording method |
| | MULTI(A) | All Blocks mode of MULTI recording system |
| | MULTI(C) | CONTINUOUS mode of MULTI recording system |
| | MULTIS(A) | AUTO mode of MULTIS recording method |
| | MULTIS(L) | LOOP mode of MULTIS recording method |
| | MULTI1(A) | All Blocks mode of MULTI1 recording system |
| | MULTI1(C) | CONTINUOUS mode of MULTI1 recording system |
| | MULTI2(A) | All Blocks mode of MULTI2 recording system |
| | MULTI2(C) | CONTINUOUS mode of MULTI2 recording system |

| | | |
|--|-----------------|--|
| | MULTI3(A) | All Blocks mode of MULTI3 recording system |
| | MULTI3(C) | CONTINUOUS mode of MULTI3 recording system |
| | LINEAR | It will automatically become REC without waiting for trigger |
| G-Sensor Trigger | | Function to detect trigger by G sensor, which is built in camera and sensed by shock. By setting as "ON", trigger signal is generated by shock given to camera body, in addition to standard trigger signal generated by user's facility |
| G-Sensor Threshold | | Specify impact level to generate trigger signal. The unit is [G] (acceleration). |
| Trigger Timing | | Sets the recording trigger position. (This setting is not valid when the recording trigger mode is BURST, MULTI1~3 and LINEAR. Change the Rec trigger mode to something other than BURST, MULTI1~3 and LINEAR to set.) |
| | START | Sets the START trigger position. |
| | CENTER | Sets the CENTER trigger position |
| | END | Sets the END trigger position. |
| | CUSTOM | Sets the CUSTOM trigger position. |
| Trigger Location [frame] | | Set the recording trigger position to an arbitrary frame. |
| Variable | | ON/OFF setting for "Variable Frame Rate |
| Frame Rate | | Recording" function. |
| Frame Rate in Speed Ratio | | Setting specifying a low recording rate with the "Variable Frame Rate Recording" function. Speed ratio for high recording rate / low recording |
| Low Speed Part Range of High Speed Part | | rate (2~100). Frames recorded with the high recording rate. |
| Frame Straddling (For PIV shooting) | | It is a frame straddling function that can shoot two images with extremely short time difference used in PIV (particle image flow velocity measurement method). (This function can be set with HX, GX-8 and ACS camera.) |
| Live Display in Frame Straddling | | It is possible to designate and display only one of the 1 st frame and the 2 nd frame for the live display of the video and the PC and it is useful for checking the irradiation timing of laser pulse lighting. |
| | ANY | Display the latest image on video / live without distinguishing between 1 st and 2 nd . |
| | 1 st | Display the latest image of 1 st frame on video / live. |
| | 2 nd | Display the latest image of 2 nd frame on video / live. |

Output Signal Settings



Item of "Output setting" (HX camera connection) 1

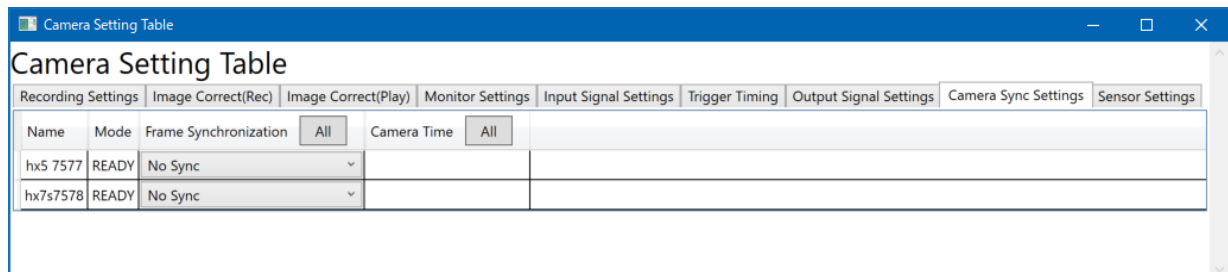


Item of "Output setting" (HX camera connection) 2

"Output setting" item (Refer to p.106)

| | |
|----------------------------|--|
| EPO Output | Select the polarity of the exposure pulse output by the camera. |
| Camera Output | Select the signal output from SYNC OUT for Q camera and RMT OUT for MX series. |
| VD OUT Polarity | Select the polarity of the synchronization signal generated inside the camera. ACS and GO are supported. |
| VD OUT Delay | Adjust the output timing of the sync signal generated inside the camera. ACS and GO are supported. |
| VD OUT Frequency | Adjust the frequency of the synchronization signal based on the camera frame rate. ACS and GO are supported. |
| ARM Status Output | Select the polarity of the ARM status signals output by the camera. |
| FAULT Status Output | Select polarity of FAULT status signal output by camera. |
| Trigger Output Mode | Select trigger output signal. |
| Trigger Output | Select the polarity of the signal to be output to the trigger output pin. |
| TRIG OUT Timing | Change the output timing of TRIG OUT. ACS and GO are supported. |
| TRIG OUT Delay | TRIG OUT Timing Change the value of DELAY. ACS and GO are supported. |
| DIO General IN | Select the ACS input connector setting. |
| DIO General OUT 1 | Select the ACS output connector 1 setting. |

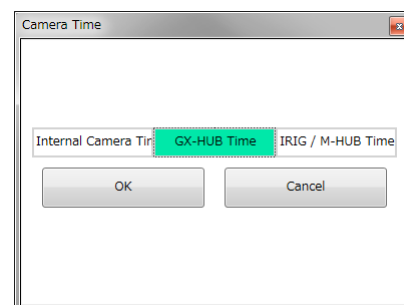
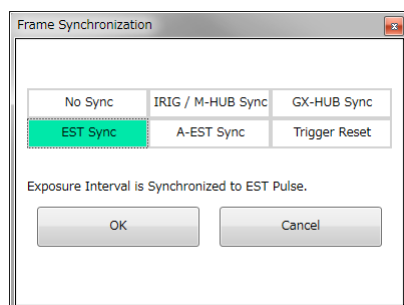
- DIO General OUT 2** Select the ACS output connector 2 setting.
- DIO General OUT 3** Select the ACS output connector 3 setting.
- Sync-Out** Select the sync output signal.
- Camera Sync Settings**



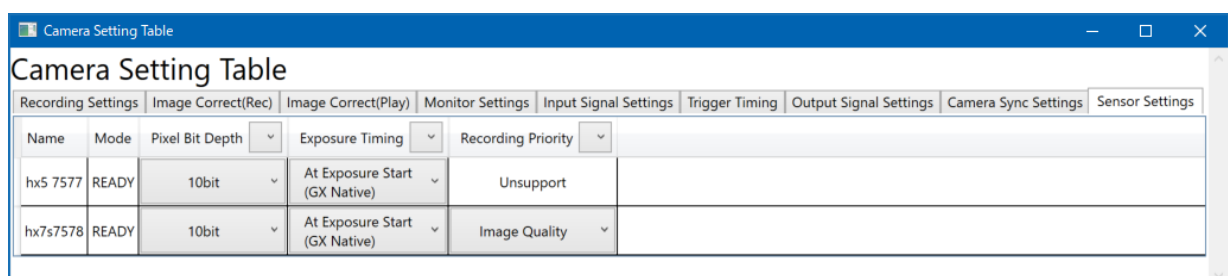
Item of "Sync setting"

- Frame Sync** Sync method selection during recording. (Refer to p.114)
- Camera Sync Signal** Select synchronized method during recording.
(Refer to p.114)

Press the [All] button in the column, the following dialog will be displayed. When this dialog is set, the setting is reflected in all the connected cameras at once.



Sensor settings



Item of "Sensor setting"

Pixel Bit Depth

Pixel bit depth setting

(The bit depth to be set varies by camera and DRP.)

| | |
|-------|-------------------------------|
| 8bit | Sets the bit length to 8bit. |
| 10bit | Sets the bit length to 10bit. |
| 12bit | Sets the bit length to 12bit. |

Exposure Timing

Sets whether exposure timing is aligned at the start of exposure, or aligned at the end of exposure.

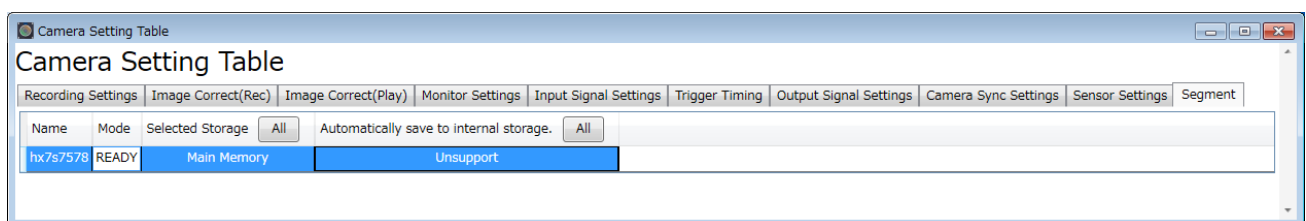
Used to match HX, GX, Q, ACS, GO camera and fx camera exposure times.

**Recording
Priority**

For Q1m, Q1v, HX-7S, Q2m, ACS-3, GO-9, GO-12, GO-4K, GO-5M.

You can set the Recording Priority to either "Sensitivity" or "Image Quality" when the camera is READY mode. The setting will be reflected when the camera starts VIEW or ARM mode.

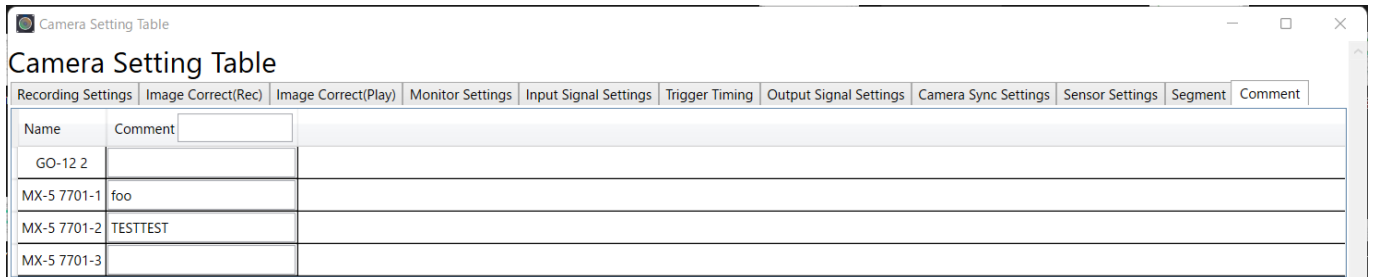
The Recording Priority is a setting of the image sensor, and changing it does not affect images that have already recorded.

Segment**Selected Storage** (Refer to p.97)**Automatically save
to internal storage** (Refer to p.97)

Comment

Enter the comments to be displayed in the "Superimpose".

You can enter a comment for each camera. Also, by using "Comment", you can enter comments for multiple cameras at once.



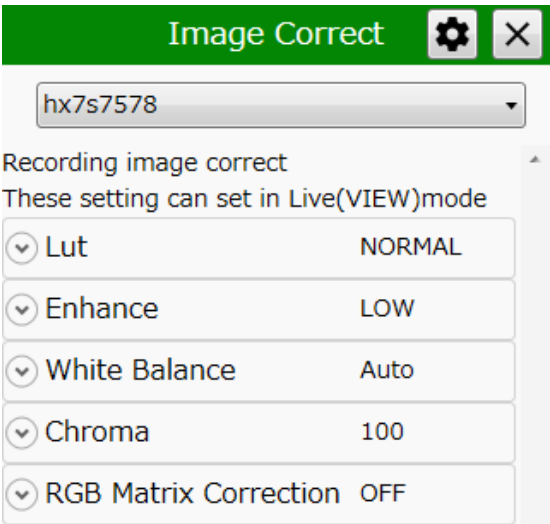
Camera Setting Table

| Name | Comment |
|-------------|----------|
| GO-12 2 | |
| MX-5 7701-1 | foo |
| MX-5 7701-2 | TESTTEST |
| MX-5 7701-3 | |

Image Quality Adjustment



Image quality adjustment can be made from the image quality adjustment panel on images currently displayed. If a live image is shown from the camera, adjust the image quality while recording, and if the file image is shown, adjust the file image quality.



Items that can be set are as follows.

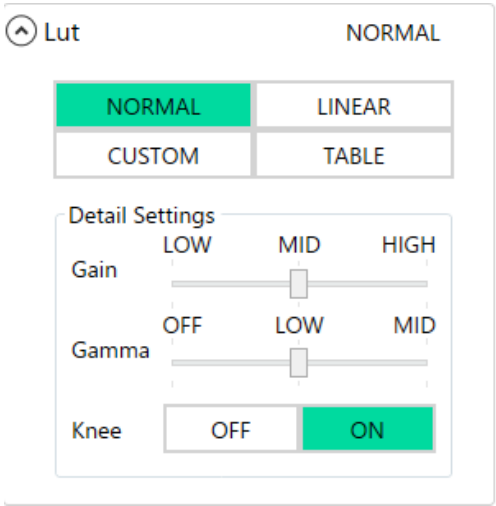
- **Luminance**
- **Enhance**
- **White Balance**
- **Chroma**
- **RGB Matrix**

Luminance

Set the input/output transfer characteristics when the image data appears.

Normal

With the normal setting, display the image with the input/output transfer characteristics coordinated with the dynamic range of the camera. Gain · gamma · knee can be used.



Gain

Set the brightness.

| Set Value | Description |
|-----------|-------------------------------------|
| LOW | Lowers the gain by one aperture. |
| NORMAL | Standard brightness. |
| HIGH | Increases the gain by one aperture. |

Gamma

Set the gamma correction.

| Set Value | Description |
|-----------|--------------------------|
| OFF | No gamma correction. |
| LOW | Low gamma correction. |
| NORMAL | Normal gamma correction. |

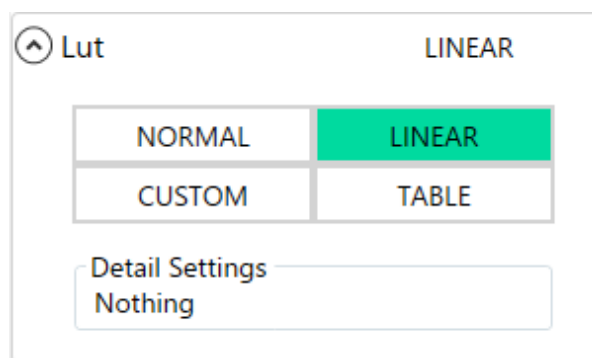
Knee

Setting where the gain is lowered relative to the signals exceeding the regulated luminance level, with or without correction to expand the dynamic range.

| Set Value | Description |
|-----------|----------------|
| ON | Knee enabled. |
| OFF | Knee disabled. |

Linear

Gain · gamma · knee settings are ignored and the data is converted to linear for display.



CUSTOM

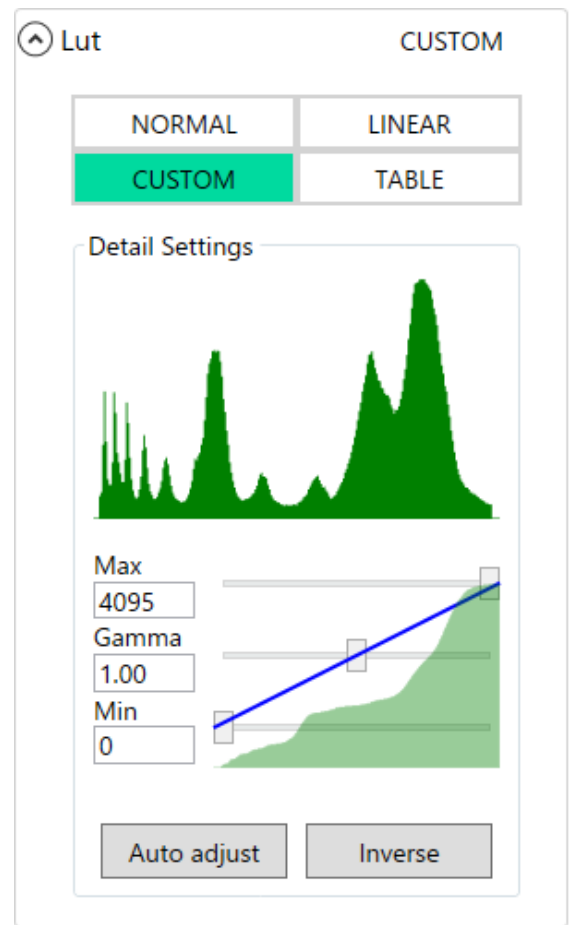
The camera data is displayed with the specified input / output conversion characteristics.

By specifying minimum luminance input value, maximum luminance input value, gamma value, even data with low luminance difference can be emphasized and displayed.

When selected, the histogram is displayed in the upper row of the detailed setting, and the cumulative frequency graph obtained by integrating the histogram in the lower row is displayed with a green fill.

The setting value graph is indicated by a blue line and means the output pixel value (vertical axis) with respect to the input pixel value (horizontal axis). This setting value graph is determined by Max (maximum brightness input value), Gamma (gamma value), Min (minimum brightness input value).

In order to obtain an appropriate dynamic range, adjust the shape of the setting value graph so that it approaches the cumulative degree graph as much as possible. Adjust so that the appropriate dynamic range is automatically obtained with the "Auto Adjust" button based on the currently displayed image.



| Set Value | Description |
|-----------|---|
| Max | Maximum brightness input value. Specify the luminance input value to represent white. (Range: 0 to 4095, initial value: 4095) |
| Gamma | Gamma value. It is used to make input / output characteristics nonlinear. (Range: 0.1 to 100, initial value: 1.0) |
| Min | Minimum luminance input value. Specify the luminance input value to represent black. (Range: 0 to 4095, initial value: 0) |

The outside of the set luminance input value is displayed as a blackout or a white overexposure.

When the relationship of values is "minimum brightness input value > maximum brightness input value", negative / positive inversion occurs. If you click the "Invert" button, the values of Max and Min will be exchanged.

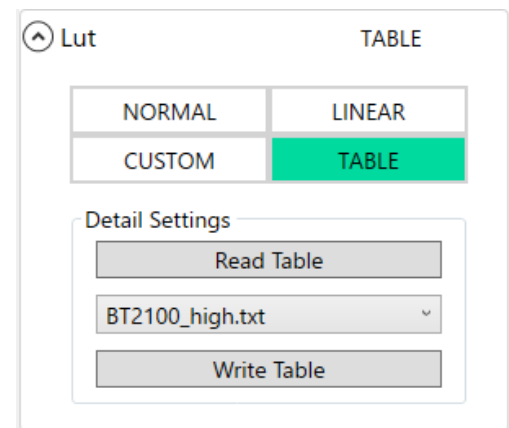
When the gamma value is 1.0, the characteristic is linear (linear).

When the gamma value is decreased, the appearance of the dark area is emphasized.

When the gamma value is increased, the appearance of the bright part is emphasized.

TABLE

Applies a user-specific luminance table from a text file. Select the "Read Table" button to load the luminance table data. Select the "Write Table" button to save the luminance table data.



The table data is a text file.

The first line represents the number of elements and is fixed to 4096. The following lines are output values corresponding to 12-bit input from 0 to 4095.

The input reference value is: black (0%) = 64, white (100%) = 2112. The input maximum value is 4095 (197%).

The output values in the table should be integers in the range of 0 to 4095, equivalent to 12 bits. The luminance table will be scaled to match the output format.

8-bit output: displayed image; conversions to AVI, BMP, JPEG, 8-bit TIFF, or 12-bit TIFF.

10-bit output: conversion to TIFF16 (monochrome) or TIFF48 (color) for files recorded with the bit depth of 8 or 10.

12-bit output: conversion to TIFF16 (monochrome) or TIFF48 (color) for files recorded with the bit depth of 12.

The figure below shows an example of table data opened in Excel.

| | A | B | C | D | E |
|----|------|---|---|---|---|
| 1 | 4096 | | | | |
| 2 | 64 | | | | |
| 3 | 65 | | | | |
| 4 | 66 | | | | |
| 5 | 67 | | | | |
| 6 | 68 | | | | |
| 7 | 69 | | | | |
| 8 | 70 | | | | |
| 9 | 71 | | | | |
| 10 | 72 | | | | |
| 11 | 73 | | | | |
| 12 | 74 | | | | |
| 13 | 75 | | | | |
| 14 | 76 | | | | |
| 15 | 77 | | | | |

| | |
|------|------|
| 4087 | 4095 |
| 4088 | 4095 |
| 4089 | 4095 |
| 4090 | 4095 |
| 4091 | 4095 |
| 4092 | 4095 |
| 4093 | 4095 |
| 4094 | 4095 |
| 4095 | 4095 |
| 4096 | 4095 |
| 4097 | 4095 |
| 4098 | |
| 4099 | |

Three types of text file of luminance TABLE data is installed in following folder at installing MLink.

MLink 32bit in Windows 64bit :

C:\Program Files (x86)\nac\MEMRECAM\MLink\LUTTable

MLink 64bit in Windows 64bit or MLink 32bit in Windows 32bit :

C:\Program Files\nac\MEMRECAM\MLink\LUTTable

Text file in above folder is displayed in pull-down list. Luminance described in selected text file is reflected to camera or MCFF file.

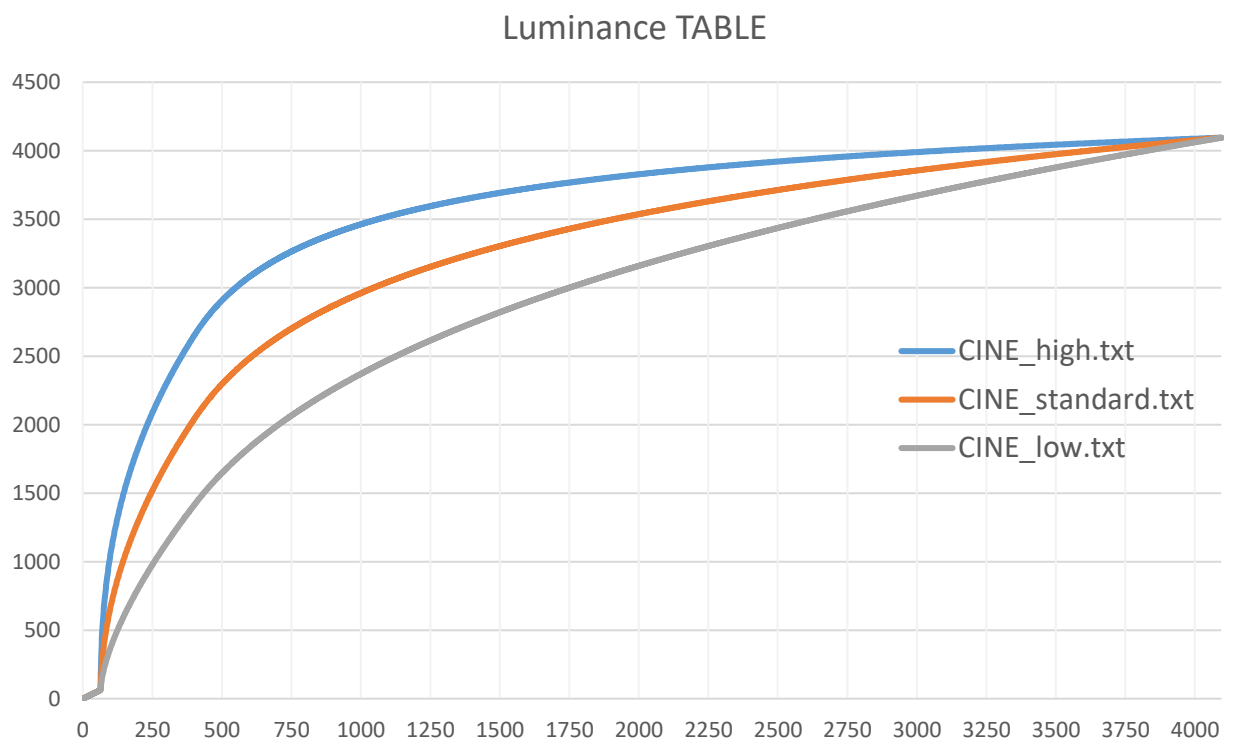
If you create luminance TABLE data as text file by such as Excel, data is displayed in pull-down list and you can reflect luminance arbitrarily to camera or MCFF file.

Following three text files are created in default.

- CINE_high.txt
- CINE_standard.txt
- CINE_low.txt

Above files contains luminance TABLE like following figure.

X-axis represents input luminance value; Y-axis represents output luminance value.



Enhance

Sets the contour enhancement.

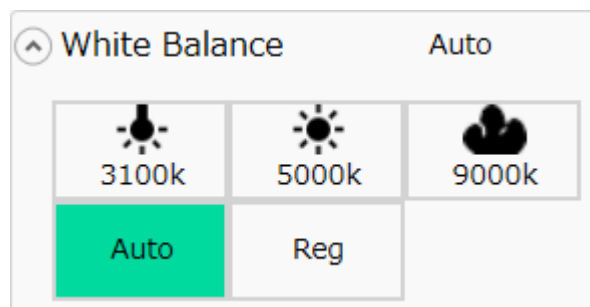
| Set Value | Description |
|-----------|-------------------------------|
| OFF | No contour enhancement. |
| LOW | Low contour enhancement. |
| MID | Standard contour enhancement. |
| HIGH | High contour enhancement. |

White Balance




Setting to match the white balance with the photographic environment.

The value set during selection is shown in green.

Selection of the setting is made by clicking the icon.



The white balance settings made from each icon are as follows.

| Icon and Name | Description |
|--|---|
|  3100k | Lightbulb Lighting color temperature set for 3100K. |
|  5000k | Sunlight Lighting color temperature set for 5000K. |
|  9000k | Cloudy sky Lighting color temperature set for 9000K. |

| | | |
|------|------|---|
| Auto | Auto | Calculates the proper RGB gain value from the image currently displayed. |
| Reg | Reg | Uses the white balance saved in the SET REG function of the camera while photographing. |

Chroma

Sets the color concentration (chroma).

| Set Value | Description |
|-----------|---|
| 0 % | Sets the chroma to 0%. Becomes a B/W image. |
| 50 % | Sets the chroma to 50%. |
| 100 % | Sets the chroma to 100%. Standard chroma. |
| 150 % | Sets the chroma to 150%. |
| 200 % | Sets the chroma to 200%. |

RGB Matrix

Sets RGB matrix correction for the image data.

| Set Value | Description |
|-----------|---------------------------------|
| ON | Enables RGB matrix correction. |
| OFF | Disables RGB matrix correction. |

Superimpose



Superimposes information such as the frame number on the image.

Superimpose

Switch the information to be superimposed on the live image of the camera.

| Set Value | Description |
|------------------|---|
| View Information | Superimposes the time information on the live image on the camera. |
| Download Preview | Superimposes information while recording on the recorded image playback of the camera memory. If an AVI download is conducted with superimposed information, the information is superimposed on the output file. |

Live information

Information superimposed as live information is as follows.

- **Show Event Mark**

Switch ON / OFF of event mark display. An event is recorded when the trigger signal is ON. When shooting with the recording trigger mode set to EVENT, the event mark is displayed even in the frame where the external trigger signal is recorded.

- **Show IRIG Lock, Event 2**

When set to ON, "IRIG lock status" of the current frame, "ON / OFF status of EST 2 signal" are superimposed and displayed.



IRIG signal is locked (green)



IRIG signal is not locked (red)



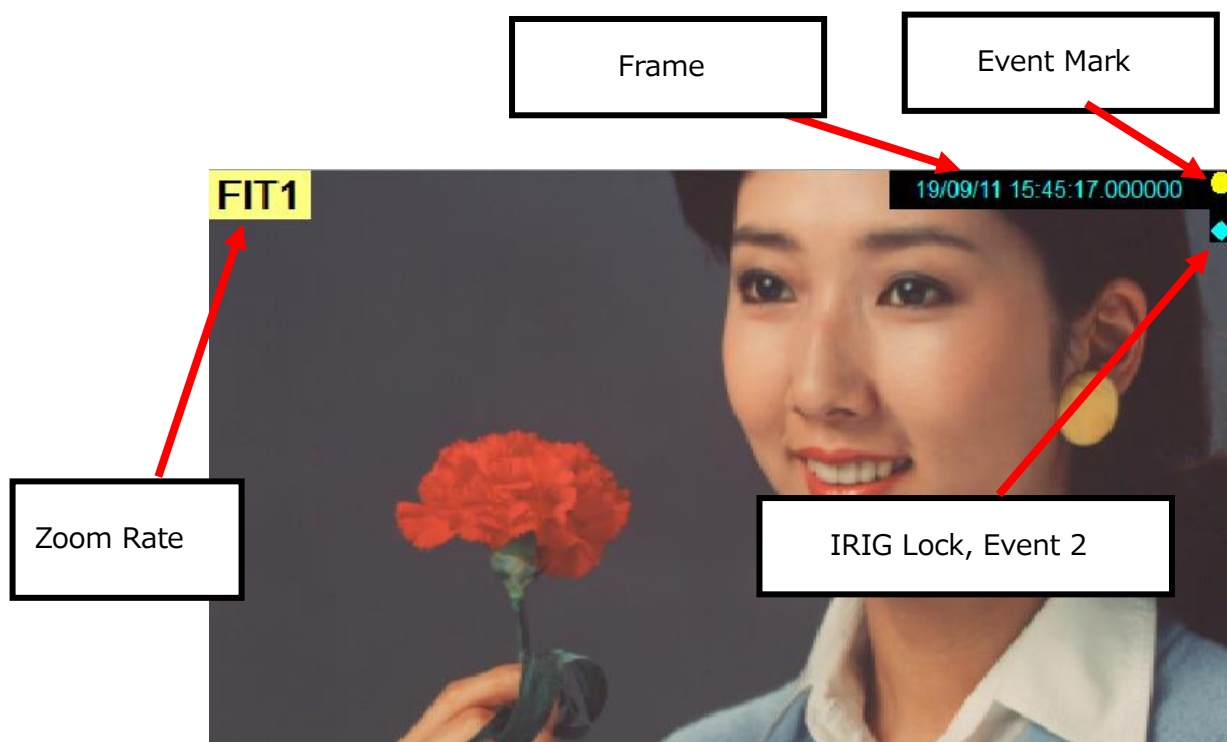
When the EST 2 signal is ON

- **Show Frame**

Toggle frame counter display ON / OFF.

- **Show Zoom Rate**

Switch ON / OFF display of the zoom setting value to be output to the video monitor.



Download Preview

You can preview the layout of the information to be superimposed when downloading AVI.

The content to be superimposed is the same as the superimposed display item in the file.

Superimpose

hx7s7580

Superimpose

Live information

Download Preview

When the camera is STOP(READY) mode, this parameter can be changed.

Information

NONE

FontSize

SMALL

Frame Format Type

FRAME NO.

Superimpose the selected image file

OFF

Superimposed Image Size

SMALL

Superimposed Image Position

UPPER LEFT

Frame Time

IRIG Lock Event2

OFF

Comment

OFF

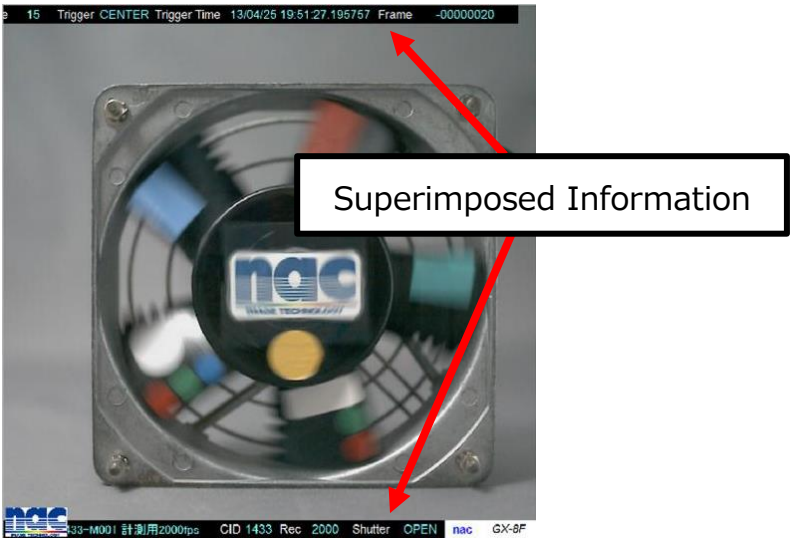
Superimposed Information

Select the items to display on the image.

| Set Value | Description |
|------------|--|
| None | Not superimposed. |
| Frame Only | Displays only the frame number. |
| All | All information is superimposed. |
| CUSTOM | Only information selected in "Custom Items for Display" is superimposed. |

The information that can be superimposed in the download preview is as follows.

- ID
- Scene
- Trigger
- Trigger Time
- Frame
- Nickname
- CID
- Rec Rate
- Shutter
- Device Type



Character Size

Select the character size for superimposing.

| Set Value | Description |
|-------------|--|
| SMALL | For image sizes of 512x512 and 640x480 |
| MEDIUM | For image sizes of 768x592 |
| LARGE | For image sizes of 1280x1024 |
| EXTRA LARGE | For image sizes of 2560x1920 |

Select whether to adjust the font size automatically according to the image width.

| Set Value | Description |
|-----------|---|
| OFF | Does not adjust font size automatically. |
| ON | <p>Adjust the font size automatically.</p> <p>If the image width is 2560 or more, the text size is set to the 'EXTRA LARGE'.</p> <p>If the image width is 1280 or more and less than 2560, the text size is set to 'LARGE'.</p> <p>If the image width is 768 or more and less than 1280, the text size is set to 'MEDIUM'.</p> <p>If the image width is less than 768, the text size is set to 'SMALL'.</p> |

Frame Display Format

Select the type of information displayed on the frame number.

| Set Value | Description |
|---------------|---|
| Frame No | Shows the frame number. |
| Relative Time | <p>Shows the frame time as a relative time.</p> <p>You can specify following settings:</p> <ul style="list-style-type: none"> • Unit of relative time • Whether to display unit • Decimal places • Integer Digits <div> <div> Frame Format Type </div> <div>RELATIVE TIME</div> </div> <div> <div>FRAME NO. RELATIVE TIME ABSOLUTE TIME</div> <div>Unit of RELATIVE TIME</div> <div> <input checked="" type="radio"/> sec <input type="radio"/> msec <input type="radio"/> usec </div> <div> <input type="checkbox"/> Display Unit Decimal places 0 </div> <div> Integer digits 0 </div> </div> |
| Absolute Time | <p>Shows the frame time as an absolute time.</p> <p>Check this box to change the frame time display from microseconds to 100 nanoseconds.</p> <div> <div>FRAME NO. RELATIVE TIME ABSOLUTE TIME</div> <div> <input type="checkbox"/> Disp 100 nsec </div> </div> |

Superimpose Image Files

Superimposes the specified image file (BMP, JPG) on the screen.

Size of Image File Superimposed

Select the size of the superimposed image relative to the image size.

| Set Value | Description |
|-------------|---|
| Small | Enlarge/reduce the width of the superimposed image to about 80 pixels. |
| Medium | Enlarge/reduce the width of the superimposed image to about 120 pixels. |
| Large | Enlarge/reduce the width of the superimposed image to about 180 pixels. |
| Actual Size | Superimpose without enlarging or reducing the superimposed image. |

Image File Location for Superimposing

Select the display location for the superimposed image (top left, bottom left, top right, bottom right)

Frame Time

Switch the time display of the camera frame.

| Set Value | | Description |
|---------------------|----------------------------------|---|
| Frame Time | Trigger | This method calculates the frame time for the recording speed with the trigger frame time as the trigger signal input time and with other frame times as the reference. |
| | Exposure | This method is the frame time that is the mid-point between the time when the sensor starts exposure and the time when exposure is stopped. |
| Frame Relative Time | Based on the trigger frame time | Standard when the trigger frame time calculates the relative frame time. The trigger frame time is subtracted from the frame time and the time becomes the relative frame time. |
| | Based on the trigger signal time | The trigger signal input time becomes the standard when calculating the relative frame time. The time subtracting the trigger signal input time from the frame time becomes the relative frame time. |
| Frame Time | Disp 100 nsec | Set the frame time display from 1 μ s unit (six decimal places of seconds) to 100 ns unit (display 7 decimal places of seconds). |

IRIG Lock Event 2

Switch ON / OFF of IRIG lock and event 2 display.

Comment

Switch ON / OFF of comment display. Comment can be edited.
Select the comment position. (“UPPER LEFT”/“UPPER RIGHT”/“LOWER LEFT”/“LOWER RIGHT”)

CommentOFF

Display

OFFON

Edit

Comment Position

UPPER LEFTUPPER RIGHT

LOWER LEFTLOWER RIGHT

Image Rotation and Inversion



Performs the settings relating to inverting and rotating the display of the live image or the playback image.

Rotate / ReverseX

hx7s7580

Flip Vert.OFF

OFFON

Flip Horz.OFF

OFFON

Rotate Image0

090180270

Vertical Inversion

Inverts the camera image in the vertical direction for display.

Horizontal Inversion

Inverts the camera image in the horizontal direction for display.

Image Rotation

Angles that can be set include 0° (standard), 90°, 180°, 270°.

If setting while also inverting, rotate the image along the path where the image is inverted.

The image rotates in the clockwise direction.

Snapshot



Saves the currently displayed image or a file image in a still image file (TIFF, BMP, JPEG).

If the camera image is displayed, you can edit snapshot file name.
Refer to "Filename Edit" for further information.

Superimpose Live information

It is displayed when a camera image is displayed on the image display part.
You can hide the time information etc. superimposed on the live image of all the connected cameras with "Disable superimposed display of live information of all cameras" button. Please use this when you want to snapshot only the camera live image.
Settings can be changed only during live (VIEW).

Filename Edit

Edit snapshot filename.
The word "filename" in this section means filename without file extension and is consist of base name and date or sequential number.
Filename settings are applied by clicking "Apply these settings" and are used as the default name of snapshots.
You can specify the following settings.

Snapshot

ACS-3 M16 7610

Superimpose Live information

Turn off all cameras live superimpose

Filename Edit

Camera Name-000

Base name

☒ Camera name

☐ User specify (in the following textbox)

sample

Add Date / Number

☐ Add Date

☒ Add Number (specify digit in the followi

3

Others

☐ Prefix Number / Date to base of filename

Apply these settings

Sample name

Camera Name-000

Format

BMP

TIFF

JPEG

Active Camera

Snapshot

All Cameras

Preset batch snapshot

Batch snapshot

Open output folder

| Settings | | Description |
|--|-------------|--|
| Base name | Camera name | Uses target camera name (nickname) as the base name. |
| | User Input | Uses the base name specified with the textbox below. |
| Add Date / Number | Add Dater | Adds date and time as of doing snapshot is added to the file name. |
| | Add Number | Adds sequential number to the file name. You can specify the number of digits from 1 to 10 with the text box below. |
| Prefix Number / Date to base of filename | ON | Number or date is placed before the base name. |
| | OFF | Number or date is appended after the base name. |

• Filename Sample

On above settings, display filename sample.

Example 1)

Camera name: ACS-1 7623

Date and time: October 30, 2018 14: 38: 32 seconds

Base name: Camera name

Add Number / Date: Add Date

Prefix Number / Date to base of filename: OFF

Image format: BMP

When you take a snapshot with the above setting, the file name becomes

" ACS-1 7623_20181029_143832.bmp ".

If you take a snapshot at the same time, a number will be added after the date and time. When the snapshot button is pressed consecutively with the above setting, it becomes as follows.

"ACS-1 7623_20181029_143832.bmp"

"ACS-1 7623_20181029_143832_1.bmp"

"ACS-1 7623_20181029_143832_2.bmp"

Example 2)

Camera name: ACS-1 7623

Date and time: October 30, 2018 14: 38: 32 seconds

Base name: User Input (Inputted string: "sample")

Add Number / Date: Add Number (Inputted digit: 3)

Prefix Number / Date to base of filename: ON

Image format: BMP

When you take a snapshot with the above setting, the file name becomes

"000-sample.bmp".

For your added information, added number is automatically counting up.

When the snapshot button is pressed consecutively with the above setting, it becomes as follows.

"000-sample.bmp"

"001-sample.bmp"

"002-sample.bmp"

Format

Select the file format to save. Click the [▼] button and select an arbitrary format.
Supported file formats are BMP, TIFF, JPEG.

Snapshot

By clicking the snapshot button, the image displayed on the image display part at that time is output to the save folder.

You can specify the default folder opened by the "Add" button in Option Settings.
(⇒ refer to p.278)

Snapshot all Cameras Preset

Use the "all snapshots" button to save the images of all the cameras in a saved folder at once.

However, in MLink, the live image of the inactive camera is not updated by the default setting in order to suppress the traffic of the live image. By clicking the "Preliminary setting of batch snapshot" button, the settings required for all cameras are changed and the camera images are displayed side by side so that you can check the live image of the camera. The settings to be changed are as follows.

- [Live Settings] – [VIEW Method] – [Standard YC] (refer to p.158)
- [Live Settings] – [MLink Live Refresh] - [All Cameras] (refer to p.159)

"Preliminary setting of collective snapshot" can be set when the camera mode is "stop (READY)".

Open output folder

Open the folder where the snapshot is saved.
This is the folder specified in option setting.

Image Overlay



While a camera is connected, a live camera image and a specific image file can be combined for display. Similarly, when playing a file, a file image and a specific image file can be combined for display.

Composite display is a function for comparison with previously photographed images and is useful when coordinating the camera angle or the position of photographed subjects. A snapshot image of a previously saved live display is used for comparing the photographed position or subject position so adjustments can be made.

Overlay image control target

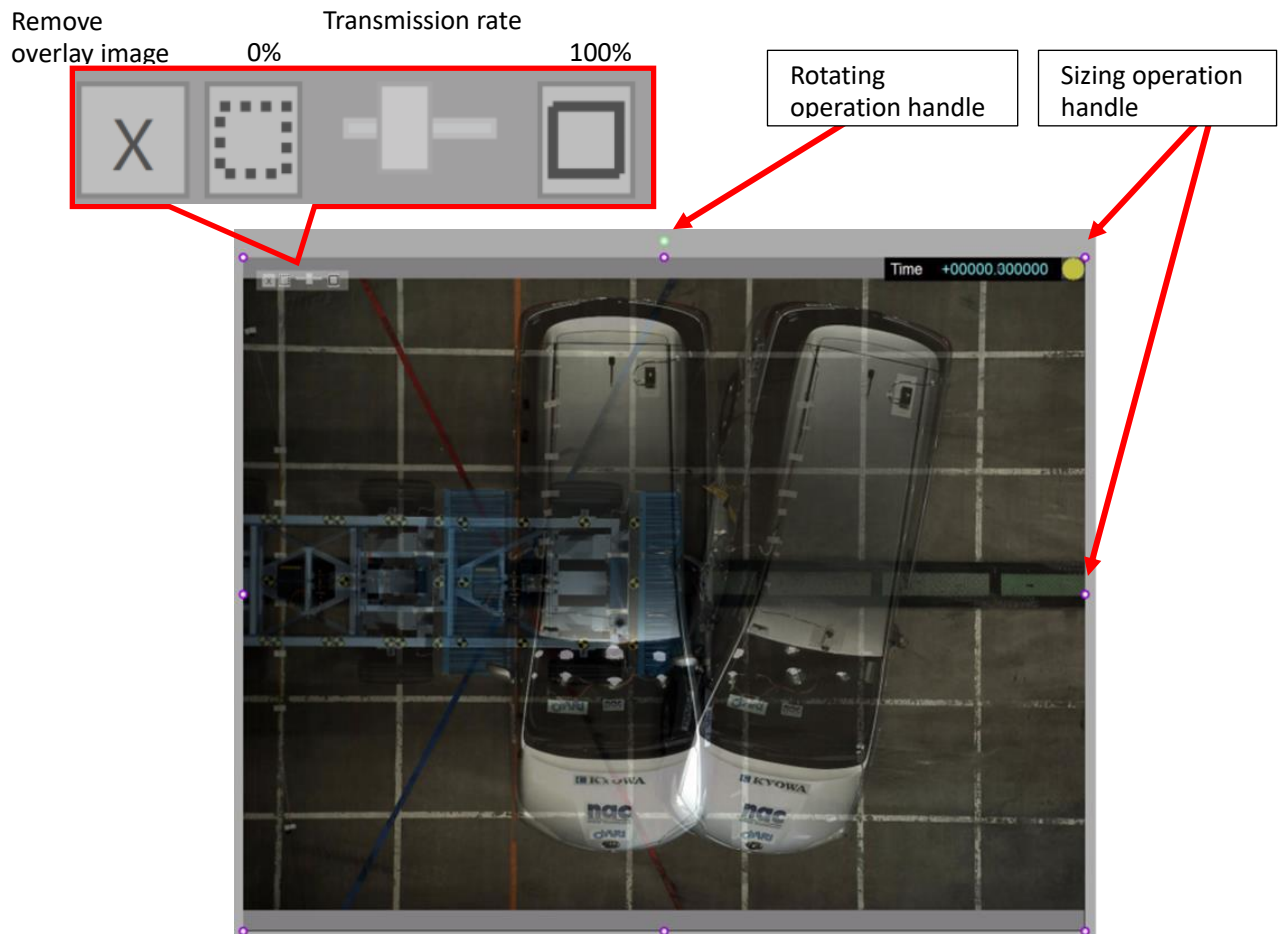
Specify the image to be superimposed on any connected camera. You can specify the camera to overlay images from the camera pull down list. When "All cameras" is selected, images are superimposed on all connected cameras.

Overlay image add & remove

Use the "Add" button to specify the image file to be superimposed. Image files that can be added are BMP, JPEG, TIFF, PNG format files. You can specify default folder when "Add" button is clicked in Option Settings. Refer to p.278. Overlay images can be overlapped with multiple images with the "Add" button. The "Remove" button deletes the active overlay image. All images overlaid on the camera are deleted with "Remove all".

Overlay image view

Temporarily turn ON / OFF the display of the image added by "ON / OFF" of "Overlay". When "Edit location" is ON, layout, size, transmittance, etc. can be edited on overlay images. When set to OFF, editing of all overlay images is prohibited without changing the overlay image display.



When the mouse cursor is superimposed on "Image Overlay " it changes to "⌵" and the position of the image can be adjusted by dragging. When changing the size, since "●" which is the operation handle is displayed around "Image Overlay", it is changed by dragging the operation handle. "Image Overlay" can be rotated by using the operation handle "●" displayed at the top.

Transmittance is changed by operating the slider displayed at the upper left of "Image Overlay". The initial value when "Image Overlay" is added is 50%, the transmittance is 100% with the "■" button on the right of the slider and 0% by the "■" button on the left. In addition, "Image Overlay" is removed by clicking "X" button.

Individual Operation

It is a setting individually reflected on the added overlay image.

| Settings | Description |
|-----------------------------|--|
| Flip vertical | When turned ON, selected image is reversed vertically. |
| Flip horizontal | When turned ON, selected image is reversed horizontally. |
| Preserve aspect ratio | When turned ON, you can resize selected image smaller or larger with the aspect ratio fixed. |
| Opacity | You can set opacity of selected image with the slider. This is the common setting with the slider superimposed on overlay image. The initial value is 50%. |
| Fit overlay to entire image | By clicking the button, overlay image is displayed with the same size as the display image. |
| Display in original size | By clicking the button, overlay image is displayed in original size. |

Frame Size Details



Performs custom settings for frame size and frame rate.

Frame Size Detail
X

hx7s7580

View Angle Display
ON

When camera is LIVE(VIEW) mode, the view angle(border) is displayed.

OFF
ON

Frame Rate
1000

Frame Size
1920 x 1080

Priority

Frame Rate

Frame Size

| | | Min | Max |
|------------|-----------------------------------|-----|------|
| Frame Rate | <input type="text" value="1000"/> | 50 | 2330 |
| Width | <input type="text" value="1920"/> | 64 | 2560 |
| Height | <input type="text" value="1080"/> | 32 | 1920 |

Angle of Field

When the camera is in the VIEW state, the image is displayed at full resolution if the angle of field is ON, and the range of resolution for the current settings is shown with a rectangular white line on the image.

Priority

Specify whether the frame rate or the resolution takes priority. For example, if "Frame Rate" is selected, the frame rate can be set for all of the cameras. The resolution that can be set is only the values that can be set with the frame rate.

Frame Rate

Set the frame rate. Since the range for the frame rate that can be set is shown with a maximum and a minimum value, any value within that range can be set.

If selecting "Frame Rate" as the priority, the maximum and minimum values for all of the

frame rates that can be set on the camera are shown, while if "Resolution" is selected as the priority setting, the maximum and minimum values for the frame rates that can be set with the set resolution are shown.

Resolution

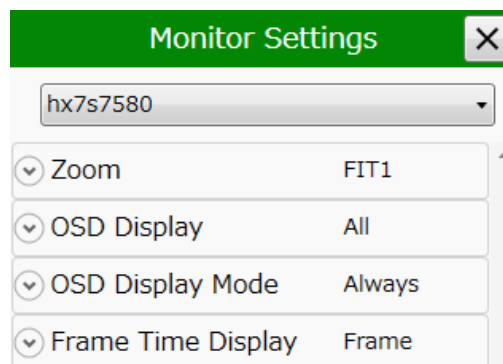
Set the resolution. Since the range for the resolution that can be set is shown with a maximum and a minimum value, any value within that range can be set.

If selecting "Resolution" as the priority, the maximum and minimum values for all of the resolutions that can be set on the camera are shown, while if "Resolution" is selected as the priority setting, the maximum and minimum values for the resolution that can be set with the set frame rate are shown.

Monitor Settings



Set the items displayed on the video monitor and viewfinder connected to the camera. Items other than "View Method" are only enabled on the HX/GX/ACS cameras with an image output terminal.



Zoom

Select the method of displaying images on the monitor connected to the camera.

| Set Value | Description |
|-----------|---|
| FIT1 | Full screen display for the maximum resolution of the video monitor. The entire image can be shown on the video monitor with overscan. <ul style="list-style-type: none"> • GX Camera Connection • With the NTSC settings, displayed at a maximum of 640×480. • With the PAL settings, displayed at a maximum of 768×576. |
| FIT2 | Full screen display for about 80% of the maximum resolution of the video monitor. Shown at a magnification where the entire image can be checked on a standard video monitor. <ul style="list-style-type: none"> • GX Camera Connection • With the NTSC settings, displayed at a maximum of 512×384. • With the PAL settings, displayed at a maximum of 640×480. |
| 1/2 | The image photographed is shown reduced to ½. |
| x1 | The image photographed is shown without being enlarged or reduced. |
| x2 | The image photographed is shown enlarged 2 times. |
| x4 | The image photographed is shown enlarged 4 times. |

OSD Display

Select items to display on the on-screen display.

| Set Value | Description |
|---------------|---|
| No display | Other than the mark at the center of the image, no information is superimposed. |
| Frame display | Only the frame counter is shown. |
| Display all | All of the information (scene, trigger time, frame counter, segment number, status, playback rate, frame rate, shutter speed) is shown as superimposed. |

OSD Display Mode

Select the display mode for the on-screen display.

| Set Value | Description |
|-----------------|---|
| Always | Superimposed information is always shown. |
| Display at STOP | Superimposed information is shown on the video monitor only when the camera is in the stop state (READY). Superimposed information is not shown when in the VIEW/RECORD (Standby)/RECORDING/PLAY/CONTINUOUS PLAY states. When in the stop state (READY), information is shown and is a useful setting when information is erased during recording or playback and only the image is shown. |

Black Balance Settings



Performs the settings relating to updating and applying the black balance.

Black Balance Setting

×

hx5 7577

Status

VAILD

Calc

Calc (All Camers)

EST Black Balance

When the camera is STOP(READY) mode, those parameters can be set.

Apply BB in Recording

ON

Apply BB in PlayBack

ON

Automatically Update BB

ON

Black Balance State

Shows the updated status for the black balance.

| Display | Description |
|---------|---------------------------------|
| NONE | Black balance is not ready. |
| BUSY | Black balance is being updated. |
| VALID | Black balance update is done. |

Black Balance Calc

Calc

Calculates the black balance for the current camera.

Calc (All Cameras)

Calculates the black balance for all connected cameras.

EST Black Balance

EST Black Balance

☒ EST
☐ Frame rate
☐ Custom [PPS]

Calculate average frame rate

Block
 Start
 End

Calculate average frame rate

Average frame rate

Set this frame rate

EST Black Balance allows you to set the calculation rate when black balance is performed.

Depending on the shooting conditions, EST signal can not be input during black balance calculation, or it is used when you want to calculate the recording speed from the data after shooting and correct the black balance.

| Set Value | Description |
|----------------------------|---|
| EST | In the case of EST synchronization, the frequency synchronized with the EST signal is used, and in other cases, the recording speed is used as the reference. If the EST signal is not input at EST synchronization, black balance calculation will fail. |
| Frame rate | Recording speed is always the basis of black balance calculation regardless of the setting of EST synchronization. |
| Custom[PPS] (HX,MX,ACS) | Any value can be specified. However, even if the setting is "custom", it may not be calculated at the specified rate. Since the maximum recording speed is determined by the exposure time of the shutter setting, the black balance is acquired at the maximum recording speed of this "shutter" when it is faster than the maximum recording speed of the "shutter" of the recording setting. |

Calculate average frame rate

Calculate the average recording rate from the recorded data.

Specify the block number, start frame and end frame, and press "Calculate average recording rate from average information" to calculate the average recording speed between the frames.

When "Set this recording rate" is pressed, the calculation result and EST black balance custom are set to the camera.

Apply Black Balance Data while Viewing

Setting for whether or not to apply the black balance data when viewing or recording.

| Set Value | Description |
|-----------|--|
| ON | Applies the calculated black balance data during recording. |
| OFF | Does not apply the calculated black balance data during recording. |

Applies Black Balance Data during Playback

Setting for whether or not to apply the black balance data when playing back.

| Set Value | Description |
|-----------|---|
| ON | Applies the calculated black balance data during playback. |
| OFF | Does not apply the calculated black balance data during playback. |

Automatic Black Balance Update (Can only be set on HX cameras)

Setting to automatically update the black balance when the camera is in "Start Viewing", "Start Recording", "End Recording", "Update Frame Size or Frame Rate", "After Startup" and "Low Light".

| Set Value | Description |
|-----------|--|
| ON | Automatically updates black balance. |
| OFF | Does not automatically update black balance. |

Automatically update or individually set the black balance for each time from the "Automatic Update List".

Individually set only when the automatic update is ON.

| Set Value | Description |
|-----------|--|
| ON | Automatically updates black balance. |
| OFF | Does not automatically update black balance. |

Live Settings



Make settings related to the live image of the camera.

Live Setting

ACS-3 M16 7623

Live Type

YC High Speed

YC High Speed

YC Standard

Change the full resolution display type to MCFF.

OFF

ON

MLink Live Refresh

Only Active Camera

Only Active Camera

All Cameras

This is a setting to change the number of cameras that update live on the application.
Depending on the environment, there is a possibility of putting pressure on the network lines.
You can change this setting when all cameras are in Stop(Ready) status.

Frame time reference

TRIGGER

TRIGGER

EXPOSURE

This value apply to all cameras.

VIEW Method
Live Type

Set the view image generation method from the camera to the PC.

| Set Value | Description |
|---------------|--|
| High speed YC | Outputs the same image as the monitor output to the PC as a live image. The refresh rates of camera monitor output and PC live image are higher than the Standard YC. Select the image zoom method from FIT1, FIT2, 1/2, x1, x2, or x4. This setting is only effective for HX cameras. |

| | |
|-------------|--|
| Standard YC | <p>Outputs the entire recording area to the PC as a live image independently of the monitor output of the camera.</p> <p>Select the image zoom method from 1/1, 1/2, or 1/4.</p> <p>This setting is only effective for HX cameras.</p> |
|-------------|--|

Change the full resolution display type to MCFF

If enabled, you can switch the display of pixel values between 8-bit RGB values and luminance values with the Switch display tone button. The luminance value display is useful to check if saturation is occurring in the image. Enabling this setting reduces the refresh rate of the live image.

MLink Live Refresh

Set the number of cameras to update live with MLink. You can change the setting when all cameras are in the stop (Ready) state.

| Set Value | Description |
|---------------|---|
| Active camera | Only the active camera updates the live image. |
| All Cameras | <p>Update live images of all cameras.</p> <p>Depending on the environment, there is a possibility of putting pressure on network lines.</p> |

Camera Frame Time

Switch the absolute time display of the camera frame. This setting applies to all connected cameras.

| Set Value | Description |
|-----------|---|
| Trigger | <p>Method that uses the trigger frame time as the trigger signal input time, and the frame time as the standard to calculate the frame time for other frames.</p> <p>With this method, the frame time does not match the time that the sensor is exposed but if using the relative time based on the trigger frame, it has the benefit of being able to make each of the frame time's uniform.</p> <p>With this setting, EST external sync recording does not display the frame time.</p> |
| Exposure | <p>Method to determine the frame time as the mid-point of the time between the time the sensor started exposure and the time exposure was completed.</p> <p>This method is appropriate for the frame image time but when performing automatic exposure, the times for each frame are not uniform.</p> <p>If using the time stamp function with the GX camera, since the image and the time information for the image are recorded in the memory, the EST external sync recording does not display the frame time.</p> |

Lens control



Make settings related to remote control of the lens.

The camera of Micro Four Thirds(MFT) mount lens which complies with the Micro Four Thirds standard, or EF mount lens can be remotely controlled.

The M-CamMFT camera head of the MX series is compatible with this function. After connecting to the M-CamMFT and displaying the lens control panel from the quick tool bar, it is displayed as follows.

Lens state

Ready

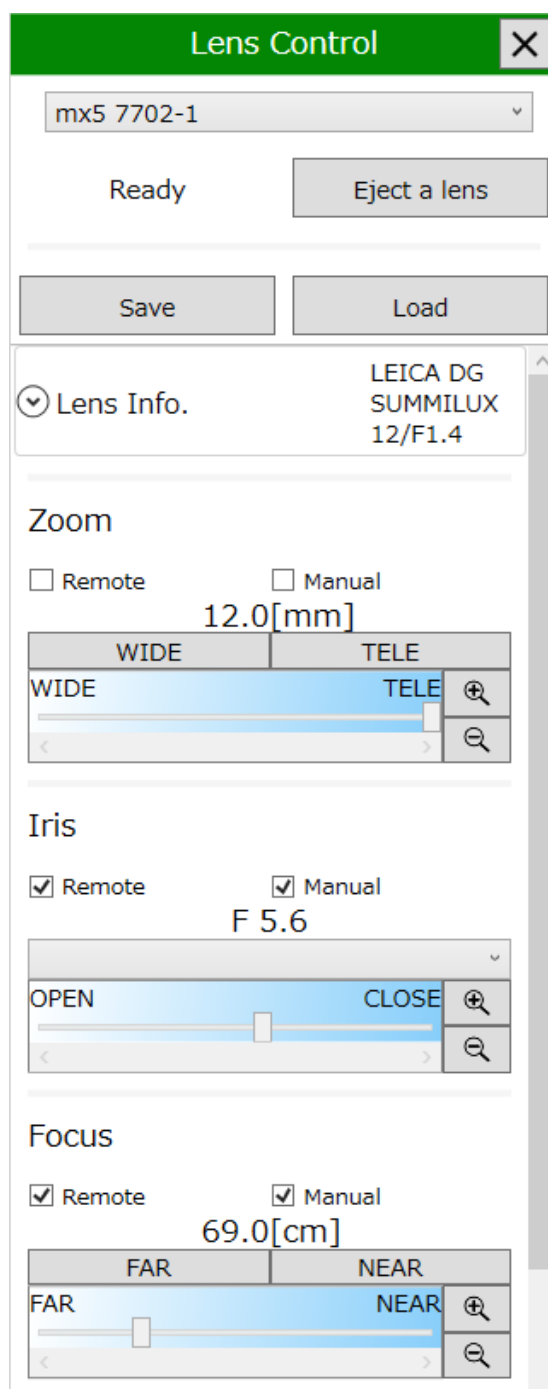
Eject a lens

It displays the attachment state of the lens and performs the operation of removal / attachment. The lens wearing state is as shown in the table below.

| Display | Meaning |
|---------|---|
| Ready | Lens operation is possible. |
| Release | The lens can be removed from the camera. Lens operation is not possible |
| Detect | Lens information is being read. |
| None | The lens is not attached to the camera. |

When activating the MX camera with the micro Four Thirds lens attached and connecting it from MLink, the status display is "Ready" and it is in the state that it can control the micro Four Thirds lens. Click

the "Remove lens" button to replace the lens when connecting. The status display becomes "detachable" and you can remove the lens. When physically removing the lens, the status display becomes "None". When micro Four Thirds lens is attached, it will be recognized automatically.



Save / load lens control file

Save or read the lens control information as a file. By saving the lens information as a file, you can reproduce the same angle of view in subsequent measurements.

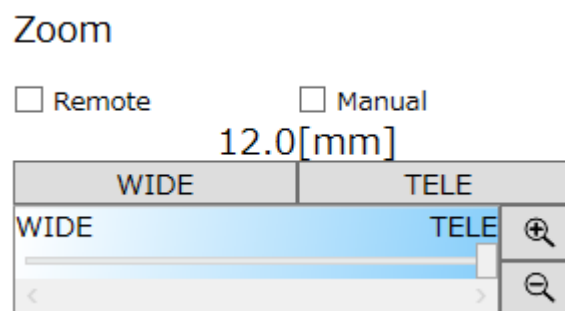
The lens control file has an extension of ".lnc".

Save : It extracts lens information from all connected cameras and writes it to a file.

Load: If there is a corresponding camera / lens combination from the loaded file, adapt it to the camera. It is not set for cameras that do not match the combination.

Lens information

Lens information such as lens type name is displayed.

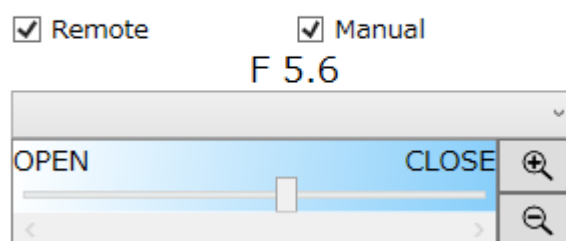
Zoom operation

The procedure for zoom adjustment is as follows.

1. Adjust the zoom distance by pressing the zoom adjustment button [WIDE] [TELE].
2. Press and hold the button for continuous movement while pressing.
3. It is also possible to adjust the zoom distance by sliding the zoom adjustment slider while clicking.
4. By pressing the reduction & enlargement button of the adjustment range, the range in the adjustment slider can be reduced & enlarged, and coarse adjustment & fine adjustment of adjustment can be performed.
5. The ON & OFF setting of the remote operation is set with or without the check button [Remote] checked. Restricting the zoom operation from the PC side by unchecking
6. ON & OFF setting of manual operation is set with / without check of the check button [Manual].

Iris operation

Iris

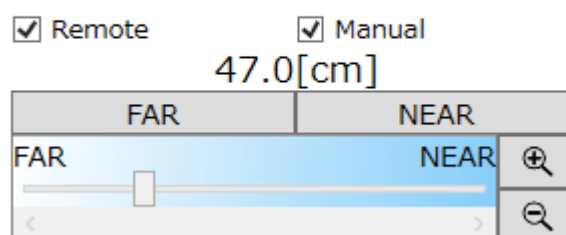


The procedure for aperture adjustment is as follows.

1. Adjust the aperture value by selecting the setting value of the pull-down display of the aperture adjustment button.
2. Adjust the aperture value by sliding the aperture adjustment slider while clicking.
3. By pressing the reduction & enlargement button of the adjustment range, the range within the adjustment area can be reduced and enlarged, and coarse adjustment and fine adjustment of the adjustment can be performed.
4. The ON & OFF setting of the remote operation is set with or without the check button [Remote]. By removing the check, you can restrict the diaphragm operation from the PC side.
5. ON & OFF setting of manual operation is set with / without check of the check button [Manual].
6. When the aperture of the lens is not compatible with remote control with only the manual ring (manual), it can not be adjusted from the MLink side. Please turn the manual ring of the lens and adjust the aperture value. Aperture setting value display F value can be adjusted according to turning the manual ring.

Focus Operation

Focus



The procedure for focus adjustment is as follows.

1. Adjust the focus position by pressing the focus adjustment button [Far] [Near].
2. Press and hold the button for continuous movement while pressing.
3. Click the focus adjustment slider and slide it to adjust the focus position.
4. By pressing the reduction & enlargement button of the adjustment range, the range within the adjustment area can be reduced and enlarged, and coarse adjustment and fine adjustment of the adjustment can be performed.
5. The ON & OFF setting of the remote operation is set with or without the check button [Remote] checked. By removing the check, you can restrict the focus operation including autofocus from the PC side.
6. ON & OFF setting of manual operation is set with / without check of the check button [Manual].

Operation of zoom, aperture, focus of micro Four Thirds lens is**1. The operation of the lens is mechanically restricted****2. Restrict manual operation on the lens****3. Restrict operation on the PC side****The operation is restricted under three conditions.**

Correct for Lens Distortion

Correct for Lens Distortion

☐ Not correct lens distortion

When checked, the image before the lens distortion correction (lens distortion correction) is performed is displayed.

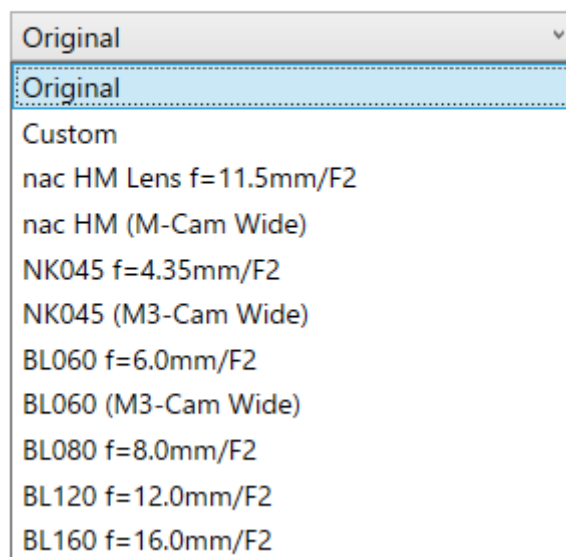
"Lens Distortion Corrected" is the default setting in M-CamMFT.

When the camera starts up, the check button is OFF.

If connecting to MX-5 camera heads other than M-CamMFT, you can select the distortion correction setting from preset lenses. The selected value will be saved to recording/downloading setting file (INI file).

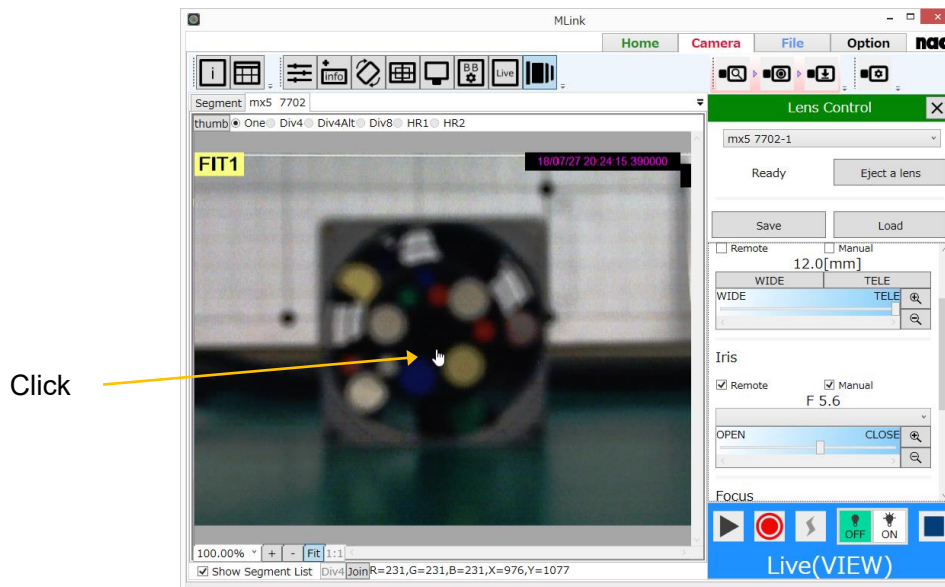
Correct for Lens Distortion

☐ Not correct lens distortion

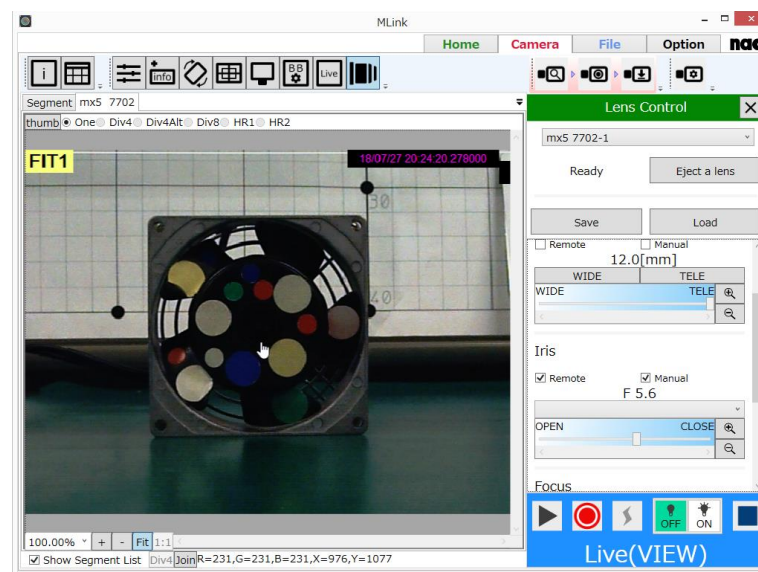


Auto focus

1. In the camera image display, position the finger mark cursor where you want to focus, and **click**.



2. The autofocus function is activated and the focus is adjusted to the image with the finger mark cursor.



3. If you want to finely adjust the focus position after the auto focus operation, adjust with the focus adjustment button and adjustment slider.

Autofocus operation is possible only in VIEW mode. It will not operate in VIEW mode.

Autofocus operation is possible when the [Lens control] panel is displayed. It does not work with the lens control panel closed.

When the EF lens is attached, the UI changes and part of the operation is different from .

Lens Control
✕

hx7 7523
▼

Lens Connection EF lens connected

⤴ Initialize

☒ Iris
 ☒ Focus

Initialize

Save

Load

⤴ Lens Info.

Canon
 EF-232
 Library v21c

Name: Canon EF-232 Library v21c
 Model:
 DetectedLens: 24mm-70mm
 Serial: 12378
 HardWareRevision: 4
 FirmVersion: 45

⤵

Zoom

70[mm]

Iris
 Iris Status
 Focus Lock ☒ Remote

6.1[F]

6.1[F]
▼

OPENCLOSE

⤵
⤴

Focus
 AF/MF AF
 Focus Status
 Focus Lock ☒ Remote
 Focus Control ☐ Relative move
 Film Distance 42cm-44cm
 Amount movement

☒ 50

500

10577

FAR

NEAR

FARNEAR

⤵
⤴

INF

MOD

EF Lens can NOT use these functions.

- Eject a Lens
- Zoom
- Auto focus
- Correct for Lens Distortion
- Manual Lock

Lens Connection

Lens Connection EF lens connected

Initialize

☒ Iris
☒ Focus

Initialize

| Status | Meaning |
|-------------------|--|
| No EF lens | EF lens is not attached. You can not operate the lens. |
| Processing | Processing EF lens settings. You can not operate the lens. |
| Updating | Updating EF mount settings. You can not operate the lens. |
| EF lens connected | EF lens can be operated. |

Initialize

Initialize iris or focus

Once the camera is turned on, EF lens can not be operated from MLink unless you initialize the iris and focus once.

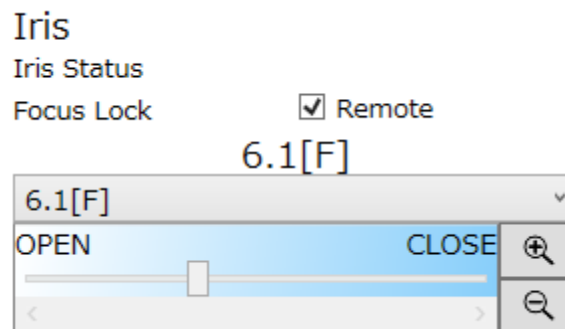
When initialization is performed, the iris and focus values are reset.

Zoom operation

Zoom
70[mm]

With EF lens, zooming is only manual operation and only focal length information is displayed.

Iris operation

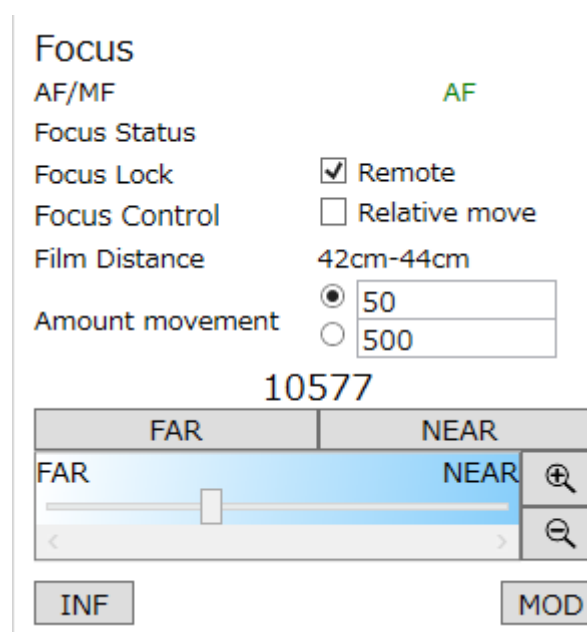


Iris status: Displays the aperture status. If the aperture is not initialized, "Uninitialized" is displayed and you can not operate. Execute the aperture initialization from the above "initialize".

Remote: Restricts control from MLink to prevent accidental operation. When the check is removed, the aperture can not be operated.

Other operations are the same as MFT's IRIS operation.

Focus Operation



There are two types of focus control of the EF lens: position movement and relative movement.

The focus turn to position movement after initialization, but if the lens is manually operated in this state, it turn to the relative movement. In relative movement, MLink can not read the

correct focus position. In that case, you need to execute initialization from MLink.

However, if initialization is performed, the focus value set up to that point will be reset.

Therefore, if you want to perform focus control without performing initialization, check Relative control.

AF / MF: Displays the AF / MF status of the lens. AF can be operated from MLink and can not be operated from MLink because the focus of the MF lens is set to MF.

Focus status: Displays the status of focus. If the focus is uninitialized or relative movement is performed, "Uninitialized" is displayed.

Focus Lock: Restricts control from MLink to prevent accidental operation. When unchecked, the focus becomes inoperable.

Focus control: Check to make relative movement, and remove to make position movement.

Film distance: Indicates the shooting distance of the lens focus setting. When a lens not compatible with the shooting distance display is attached, "---" is displayed.

Amount movement: Set the movement amount per click of "FAR" and "NEAR".

FAR: Move the focus to a distance.

NEAR: Move the focus closer.

Focus adjustment slider: Adjusts the focus position. You can operate in the same way as the MFT focus. However, it can not be used during relative movement.

INF: Sets the focus position to infinity.

MOD: Sets the focus position to the shortest shooting distance.

Image Trigger (Brightness Detection Trigger)



The image trigger function measures the light in the brightness detection area specifying the image to be photographed, and is the function that automatically sends the trigger when the brightness within the area changes.

Some models can not use the image trigger function.

HX series, ACS series cameras, some cameras of the GX series (GX - 8 etc.) can use the image trigger function. For details, please refer to the operation manual of the camera.

The image trigger function can not be used together with the automatic exposure function (AE). When using the image trigger function, turn off the automatic exposure function (AE).

Image Trigger

Select the level of luminance change.

| Set Value | Description |
|-----------|---|
| OFF | Image trigger function not used. |
| LOW | (Low) trigger send with large changes in brightness |
| MID | (Standard) trigger send with medium changes in brightness |
| HIGH | (High) trigger send with small changes in brightness |
| CUSTOM | Fine adjustments of the trigger sending conditions (HX camera only) |

If the image trigger set value does not match the recording conditions, there is a possibility that an unexpected trigger is send [A] or a trigger isn't send in the required location [B]. Determine the appropriate value after conducting a test photograph. The criteria is shown below.

| Set Value | Matching Photographic Environments | Non-conforming Photographic Environments | Unusable Photographic Environments |
|-----------|--|---|---|
| LOW | Recording in an environment where there are flickering elements due to fluorescent lighting | Recording where large changes in the brightness are not expected [B] | Recording in an environment where there are flickering elements due to fluorescent lighting [A] |
| MID | Recording where the brightness of the general lighted area does not change, such as with flashes | Recording where the subjects cross the lighted area due a lack of size [B] | |
| HIGH | Recording where the subjects cross the lighted area | Recording in an environment where there are elements in motion, other than subjects within the lighted area [A] | |

Custom Image Trigger

There are three types of custom image triggers, so select according to the application.

Level of brightness Custom

Type

Upper Limit [%]

Lower Limit [%]

- **RATIO**

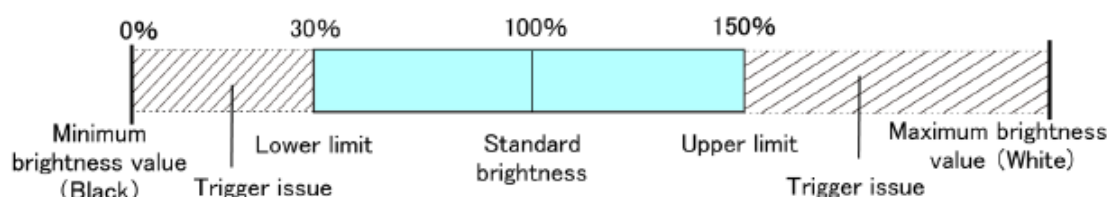
Specify the threshold value using 0% as the minimum brightness value (black) and 100% as the standard brightness. (GX compatible)

RATIO can be used outdoors where the standard brightness changes.

Range of input -3276.8 ~ -3276.7 % (input limitation)

Practical range 0 ~ 100% or higher

Input example Lower limit of 30%, upper limit of 150%



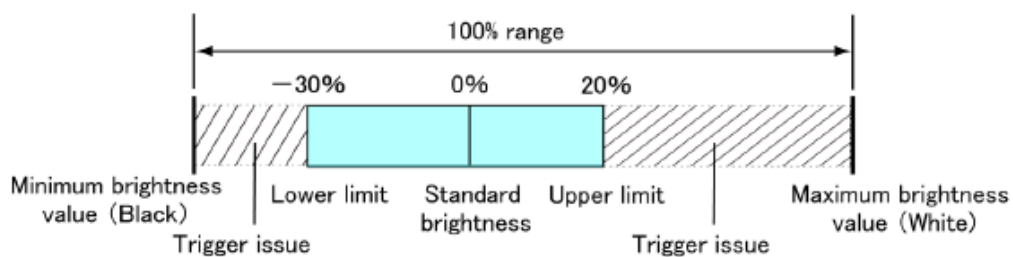
• **DIST**

Specify the threshold value using 0% as the standard brightness and 100% as a range from the minimum brightness value (black) to the maximum brightness value (white). DIST can be used outdoors where the standard brightness changes.

Range of input -3276.8 ~ -3276.7 % (input limitation)

Practical range -100 ~ 100%

Input example Lower limit of -30%, upper limit of 20%



• **ABS**

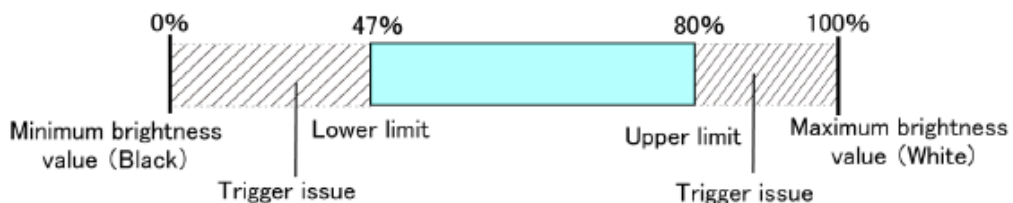
Specify the threshold value using 0% as the minimum brightness value (black) and 100% as the maximum brightness value (white).

ABS can be used in environments not impacted by outside light, such as indoors.

Range of input -3276.8 ~ -3276.7 % (input limitation)

Practical range 0 ~ 100%

Input example Lower limit of 47%, upper limit of 80%



Brightness Standard

Sets the timing at which the reference brightness is set.

| Set Value | Description |
|-----------|--|
| TRACKING | Sets the camera corresponding to the photographic environment as the standard. (GX compatible) Prevents trigger from sending for phenomenon with gradual changes in brightness (clouds, time, changes in standby status) . |
| START | Brightness at the start of ARM is the reference |
| MANUAL | "Manual execution" button is enabled at ARM start. It is based on the luminance at the timing of clicking the "manual execution" button. |

Area (AOI)

Sets the area where luminance is detected on the image.

| Set Value | Description |
|-----------|---|
| FULL | The entire frame is the range. |
| CENTER | 50% of a rectangle (area of 25%) from the center of the frame is the range. |
| UPPER | The upper half of the frame is the range. |
| LOWER | The lower half of the frame is the range. |
| LEFT | The left half of the frame is the range. |
| RIGHT | The right half of the frame is the range. |

Size of block size

It is a function supported by the ACS camera.

The detection area is divided by the block size and displayed in grid.

Image Trigger Test

It is a function supported by the ACS camera.

You can check during the live (VIEW) whether the trigger is entered as expected.

To execute the image trigger test, turn on the image trigger, put it into live (VIEW) mode, and click the start button. The image trigger test mode is set to "RUN". If the trigger is triggered by the luminance change during the test, it becomes "TRIGGERED".

Fan Stop



By pausing the cooling fans in the cameras, it is possible to prevent image shaking due to camera vibration. HX camera and ACS camera support this function.

To prevent an increase in the camera temperature, the time the cooling fans are paused varies by camera. Refer to the HX · ACS · GO camera user's manual for operations such as cooling times.

The status of the camera selected in the pull-down list is displayed.

Fan Stop
✕

ac1 7562
▼

| | |
|-------------------------------|---------|
| Status | Cooling |
| Limit Temperature | 85 |
| Current Temperature | 75 |
| Fan Stop Time [s] | 60 |
| Stopped Remaining Time [s] | 00:00 |
| Fan Stop Prohibition Time [s] | --- |

Fan Control Mode

FULL

AUTO

Stop (only this)

Stop (all cameras)

Start up the fan.

Status

It indicates the current operating state of the fan.

Ready : Fan operating. It is in a state where the fan can be stopped.

Cooling: Fan operating. The fan can not be stopped because it is under forced cooling.

Stop : The fan is stopped.

Limit

Temperature

It is the upper limit temperature which guarantees the operation of the camera. When the temperature of the camera exceeds the upper limit, the fan is forcibly activated. Fan stop can not be executed until the camera temperature falls below the upper limit.

Current

Temperature

Displays the current temperature of the camera.

Fan Stop

Time [s]

Specify the time to stop the fan in seconds. ACS, GO camera can specify time arbitrarily. The HX camera is fixed for 60 seconds.

| | |
|--------------------------------------|---|
| Stopped Remaining Time [s] | It indicates the remaining time from when the fan stop is executed to when it is canceled. |
| Fan Stop Prohibition Time [s] | It is the time to forcibly start up the fan and cool it because the temperature of the camera has risen. Fan stop and camera operation are not possible until this time becomes zero. |
| Fan control mode | <p>FULL : Forcibly set fan rotation speed to maximum. In this mode, the cooling fan can be stopped.</p> <p>AUTO : It monitors the temperature inside the camera and automatically controls the number of revolutions of the fan. As the temperature rises, the fan speed will also rise. In this mode, the cooling fan can not be stopped.</p> <p>※ This function is only for ACS, GO cameras, it is not displayed on HX cameras.</p> |
| Pause (only this) | Execute fan stop for the selected camera. |
| Pause (all cameras) | Execute fan stop for all cameras that support the connected fan stop function. If one of the cameras is in a state in which the fan can not be stopped (cooling), it is not possible to stop the fan of all the cameras. |
| Start up the Fan | <p>For the camera that stops the fan, cancel the fan stop and restart the cooling fan.</p> <p>※ This function is only for ACS, GO cameras, it is not displayed on HX cameras.</p> |

HDR Settings

HDR

Sets HDR function.

HDR function is a recording function that it extends dynamic range like DRES function of GX/HX series camera.

You can set shutter settings with Recording settings, and you can set luminance conversion settings with Tonemap Settings.

Recording Setting is available only in VIEW mode.

HDR Settings

ACS-3 M16 7623

HDR settings for REC
 Enable to set in VIEW mode.

Recording Settings HDR Level : 6

HDR Level
 6
 HDR Level exceeds possible setting range of sensor.
 Working for HDR Level 5.

Exposure Ratio 10
 Basic Shutter 10.0 μs

CUSTOM
 CUSTOM
 CLOSE OPEN
 μSec. 10.0
 1/n Sec. 100000
 Short Exp Shutter 1.00 μs

Tonemap settings for REC ToneMap1

Select Tonemap
 Tonemap1 Tonemap2

Tonemap parameters setting
 y_bp 122
 e_bp 2352
 e_max 32760
 HDRLv. 6
 ExpRatio 10

Graph showing Tonemap function (Y-axis: 0 to 200, X-axis: 0 to 40000).

Recording Settings

Setting contents

| | |
|--------------------------|---|
| HDR Level | <p>Sets HDR Level. The higher HDR Level, dynamic range is extended wider, and you can record object with a larger difference in luminance.</p> <p>Click pull-down menu and select OFF or 10-step HDR Level. Refer to Dynamic Range of HDR Level chart in next page.</p> <p>If short exposure shutter is lower than 1μs, following message is displayed, and HDR function works at a lower HDR Level than you selected.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>HDR Level exceeds possible setting range of sensor. Working for HDR Level 5.</p> </div> |
| Exposure Ratio | <p>Displays the ratio of exposure time between basic shutter and short shutter. This value depends on HDR Level and is described as follows.</p> <p>[Exposure Ratio = HDR Level \times 2]</p> |
| Basic Shutter | Displays current value of shutter speed. |
| Shutter Setting | <p>Sets shutter speed.</p> <p>Refer to Recording Settings (p.61) for more information.</p> |
| Short Exp Shutter | <p>Displays short exposure shutter. This value depends on Basic Shutter and Exposure Ratio, and is described as follows.</p> <p>[Short Exposure Shutter = Basic Shutter / Exposure Ratio]</p> |

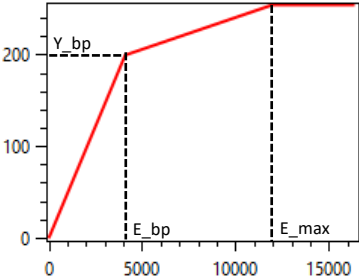
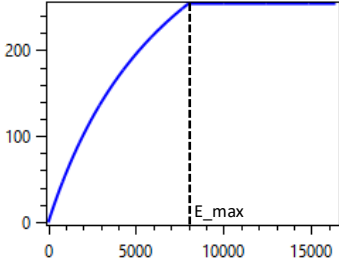
Dynamic Range of HDR Level

| Setting | Dynamic Range | Shutter restriction | Recording speed restriction |
|----------|---------------|---------------------|-----------------------------|
| OFF | 200% | none | none |
| Level 1 | 400% | 2 μ s or more | 499,990 pps or less |
| Level 2 | 800% | 4 μ s or more | 249,990 pps or less |
| Level 3 | 1200% | 6 μ s or more | 166,660 pps or less |
| Level 4 | 1600% | 8 μ s or more | 124,990 pps or less |
| Level 5 | 2000% | 10 μ s or more | 99,990 pps or less |
| Level 6 | 2400% | 12 μ s or more | 83,330 pps or less |
| Level 7 | 2800% | 14 μ s or more | 71,420 pps or less |
| Level 8 | 3200% | 16 μ s or more | 62,490 pps or less |
| Level 9 | 3600% | 18 μ s or more | 55,550 pps or less |
| Level 10 | 4000% | 20 μ s or more | 49,990 pps or less |

Tonemap Settings

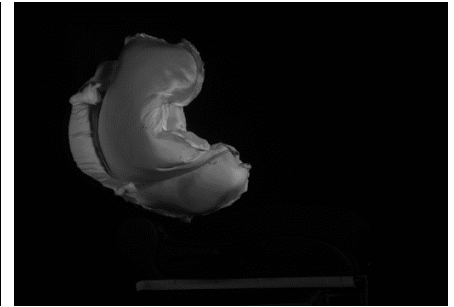
The effect of Tonemap parameter depends on HDR Level. Readjust Tonemap parameter after you change HDR Level.

Setting contents

| | | |
|----------------------------|--|---------------------------------------|
| Select Tonemap | Selects Tonemap1 / Tonemap2. | |
| Tonemap parameters setting | Sets each tonemap parameter and displays the luminance conversion characteristics at the current settings. | |
| | <div>Tonemap1</div>  <p>The horizontal is the input of Tonemap, and the vertical axis is the output of Tonemap.</p> <p>Specify the upper limit of input luminance with E_max, and specify the breaking point with Y_bp and E_bp. If you have blown out highlights in the image, increase the E_max and adjust it.</p> | |
| | Y_bp | Range : [1, 255] |
| | E_bp | Range : [1, 4095] |
| | E_max | Range : [8000, 4095 × Exposure Ratio] |
| | <div>Tonemap2</div>  <p>Specify the upper limit of input luminance with E_max, and specify the curve characteristics with E_cp. If you have blown out highlights in the image, increase the E_max and adjust it.</p> | |

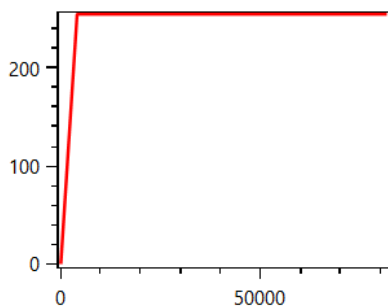
| | | |
|--|-------|---|
| | E_cp | Range : [500, 8000] The range is [2000, 6000] if you are connecting to ACS camera with firmware version earlier than 2.13. |
| | E_max | Range : [8000, 4095 × Exposure Ratio] |

Example of use



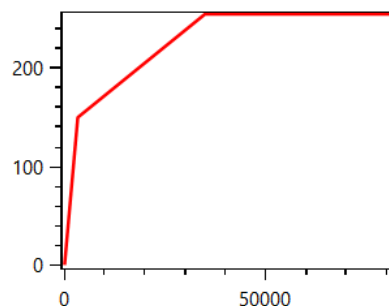
[Equivalent to Basic Exposure]

Tonemap1
HDR Level : 10
Y_bp : 255
E_bp : 4095
E_max : 8000



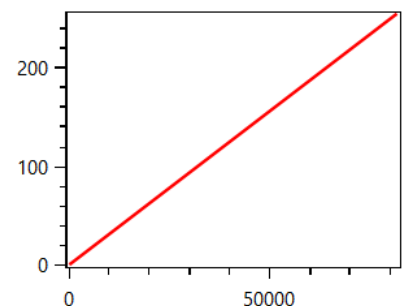
[Both dark and bright area are visible]

Tonemap1
HDR Level : 10
Y_bp : 150
E_bp : 3300
E_max : 35000



[Equivalent to Short Exposure]

Tonemap1
HDR Level : 10
Y_bp : 1
E_bp : 1
E_max : 81900



In the image on the left, the details of seat in the dark area are clearly visible, but the airbag in the bright area are blown out.

In the image on the right, the details of airbag in the bright area are clearly visible, but the seat in the dark are blacked out.

Referring to these, adjust Tonemap parameter so that both dark and bright area are clearly visible like the image on the center.

Usage of HDR function

This part explains the procedure to adjust settings for recording with HDR function.

- 1) Adjust the lens aperture based on the depth of field you desire.
- 2) Set exposure time so as not to blur image. If luminance of dark area is not enough, you need to readjust.
- 3) Set shutter speed and exposure time for dark area based on the speed of object.
- 4) Set exposure time for dark and bright areas.
 - 4-1) Exposure time for dark area
Turn off HDR function and adjust exposure time for dark area..
Adjust exposure time with shutter speed and lens aperture so that image is not blurred, dark area is visible, and there is no block up shadows.
 - 4-2) HDR Level
Select a HDR Level that does not cause blown out in the bright areas.
- 5) Record.
- 6) Adjust Tonemap and confirm that both dark and bright areas are visible. Then, take a record for actual testing with adjusted values.

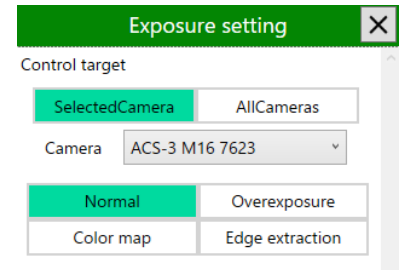
Exposure Setting



Colorizes images according to the pixel values. This function is useful for checking the amount of the light during recording.

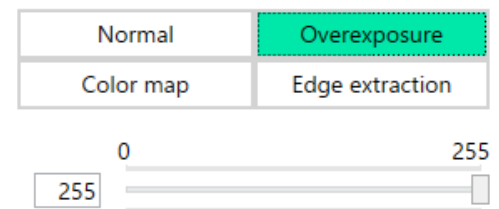
Normal

Displays the original image.



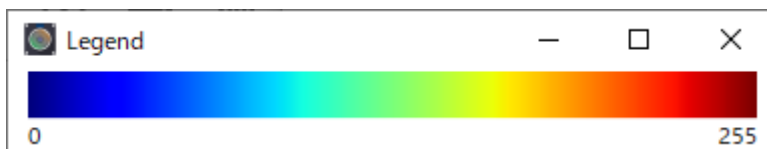
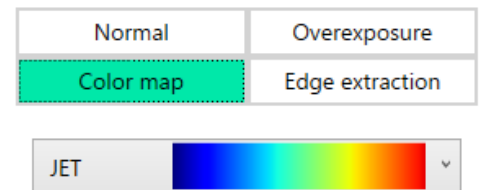
Overexposure

Displays the pixels whose luminance exceeds the threshold value in red. The threshold value can be adjusted with the slider.



Color map

Maps luminance to color to display the image luminance in color. The artificial color and the luminance can be viewed in the Legend window. The luminance range and corresponding colors cannot be changed.

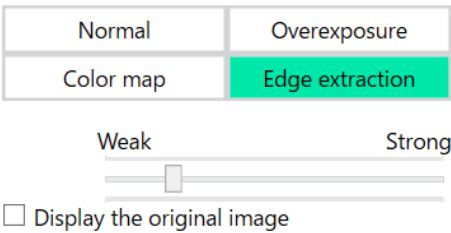


You can select a color map from the pull-down list as shown in the right figure.



Edge extraction

Pixels that detect luminance differences as edges are displayed in red. The edge detection threshold can be adjusted with the slider. If you adjust the slider to "Strong", the threshold will be lowered and even small luminance differences will be detected as edges. On the other hand, adjusting the slider to Weak increases the threshold and reduces edge detection. This function is useful for focusing the lens.



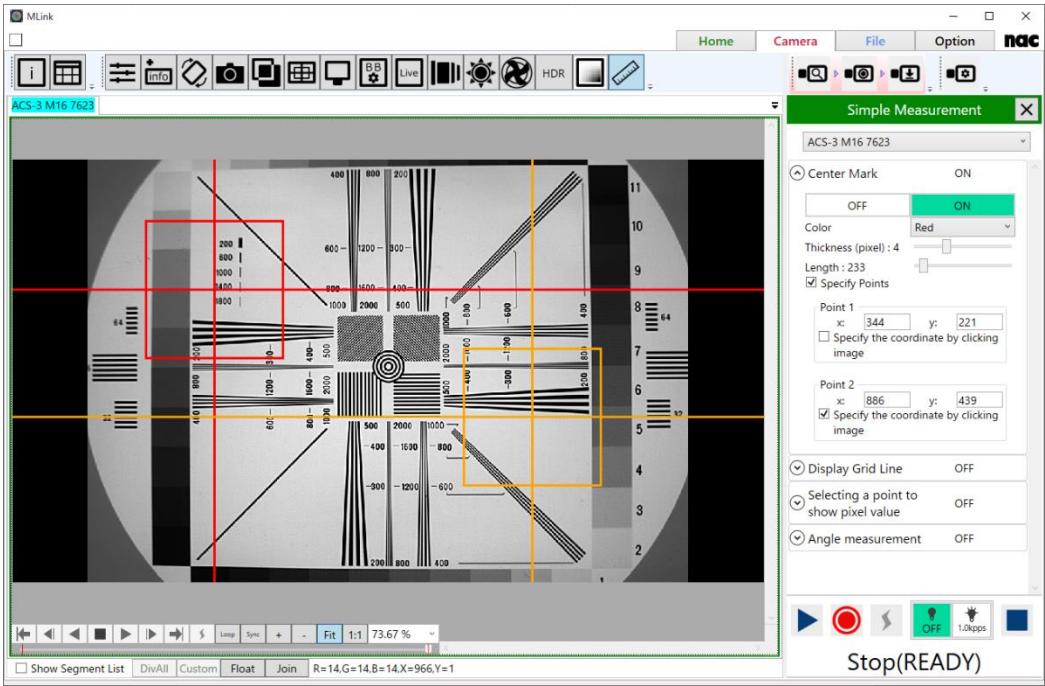
Simple measurement



Provide simple image measurement.

Center Mark

You can overlay a cross mark and rectangle at the center of the image. Or, by specifying two points in image, you can overlay two cross marks and rectangles.



You can set line color, thickness, and the length of rectangles.

If the **Specify Points** checkbox is checked, you can select two points as the center of cross marks and rectangles. The points are selected by clicking on the image or entering a coordinate value into the textbox.

To select the points by clicking, check the **Specify the coordinate by clicking** checkbox for the point you want to set. If you check one of the two, the other will be disabled because you cannot set two points by one click. Uncheck the checkbox after you decided the position.

Grid Line

You can display grid lines, and you can specify their color, thickness, horizontal and vertical interval, and origin point. The origin point is selected from the upper left, lower left, or center of the image.

Ruler Display

You can display the ruler on the image. The following three types of rulers are displayed.

- Pixel

Draws a ruler with a pixel width specified by "RulerWidth".

- Manual

Draw a ruler according to the specified "RulerWidth" by calculating the distance in pixel units of the line segment from the pixel coordinates of the two points specified and acquired on the image and entering the actual distance of the line segment separately. To specify a point, select "Specify the coordinate by clicking image" and click on the image.

Use Photo. Info.

By entering the camera type and lens magnification used for shooting, rulers are drawn according to the specified "RulerWidth".

Selecting a point to show pixel value

You can select a point to show the pixel value. If selected, the pixel value displayed in status bar shows the value of the selected point, not the point at the mouse cursor. You can specify line color, line thickness, and the coordinate value of the point.

Distance measurement

By clicking the mouse, specify two points on the image and draw a line segment connecting the specified two points and the distance in pixels. You can also cancel the position specification by double-clicking the specified point.

Angle measurement

Measures an angle between two lines defined by selected points.

To select points, enable **Select a point by clicking / Unselect a point by double-clicking** and click on the image. The coordinates of points are displayed in **Point 1, Point 2, Point 3,** and **Point 4** in the order they were added, and the points are drawn. Double-clicking on the image deletes the points in order from the newest one. You can select measurement points for each camera and each file.

You can select the measurement type from 3-points and 4-points. In 3-points type, a line connecting Point 1 and Point 2 and a line connecting Point 2 and Point 3 will be drawn. In 4-points type, a line connecting Point 1 and Point 2 and a line connecting Point 3 and Point 4 will be drawn. In both cases, the angle from the second line to the first line will be measured in clockwise and counterclockwise direction. The angle is in degrees.

The color and thickness of line can be changed by drop-down menu and slider bar.

Clear all points clears all points and measured angles.

⬆

Angle measurement

ON

OFF

ON

Color

Red

Thickness (pixel) : 1

☐

Select a point by clicking /
Unselect a point by double-clicking

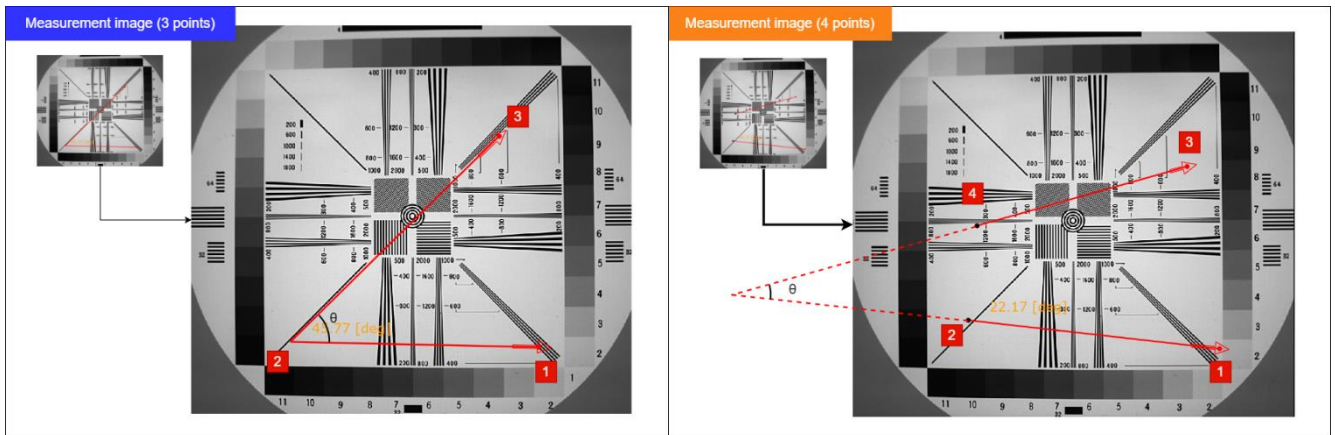
3 points

4 points

Calculated on two lines.

Point 1:
Point 2:
Point 3:
Angle(Clockwise)
Angle(Anticlockwise)

Clear all points



Waveform input setting



Sets waveform input.

Sets waveform input.

This setting is only for the paid MEMRECAM Waveform Input Software (SP-631), and a license key is required to use it.

With this software SP-631, you can capture analog data (waveform data) at the same time as recording with a MEMRECAM series camera, and save it to your PC.

For details on MEMRECAM Waveform Input Software, please contact our sales department.

4.2 MLink Mobile

Through Wi-Fi, live images of the camera can be displayed on the mobile terminal.

PC (MLink PC) running MLink (64 bit version) and MEMRECAM are connected by wired LAN as before, and Wi - Fi connects the MLink PC and the mobile terminal. It operates on the tablet-equipped Web browser. Application installation etc is unnecessary.

Update displaying UI of MLink Mobile

By installing update patch that is included in MLink install DVD, you can update user interface of MLink Mobile to latest version.

Execute "NciaServer.x64.msi" (install DVD -> "MLink" folder) and start installer.

While installing, there is no need to do special setting. By following wizard, complete installation.

4.2.1 Operational confirmation environment

Mobile computer

mac checks the operation with the following tablet.

| Type | Manufacturer product name | OS | Web browser |
|----------------|------------------------------|----------------------------------|----------------------------------|
| Windows Tablet | Microsoft Surface Pro 4 | Windows 10 Pro (Version 1511) | Microsoft Edge (25.10586.0.0) |
| Android Tablet | HUAWEI MediaPad M3 | Android 6.0 | Chrome (54.0.2840.85) |
| iOS Tablet | Apple iPad Pro (9.7inch) | iOS (9.3.1) | Safari |

Even if there is a description of the OS / browser etc., it may not operate properly due to upgrading in the future etc. Please note.

MLink PC

| OS | Application |
|-------------------------------------|----------------------------|
| Windows 10 Pro 64bit (Version 1709) | MLink 64bit (Version 1.30) |
| Windows 8.1 Pro 64bit | MLink 64bit (Version 1.30) |

Windows 7 SP1 Ultimate 64bit

MLink 64bit (Version 1.30)

**"MLink Mobile" is a function of only 64-bit version MLink.
It does not correspond with 32 bit version MLink.**

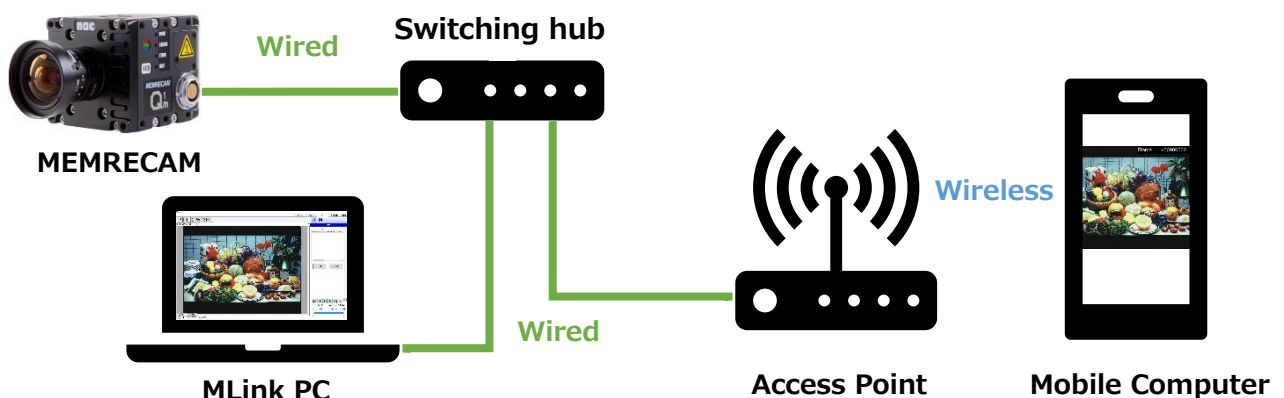
4.2.2 Supported camera

Cameras that can display live images on MLink Mobile are GX series, HX series, Q series cameras. The MX series cameras do not support the MLink Mobile function, but Wi-Fi connection is possible in the same way with the nac WebPanel function of the MX camera.

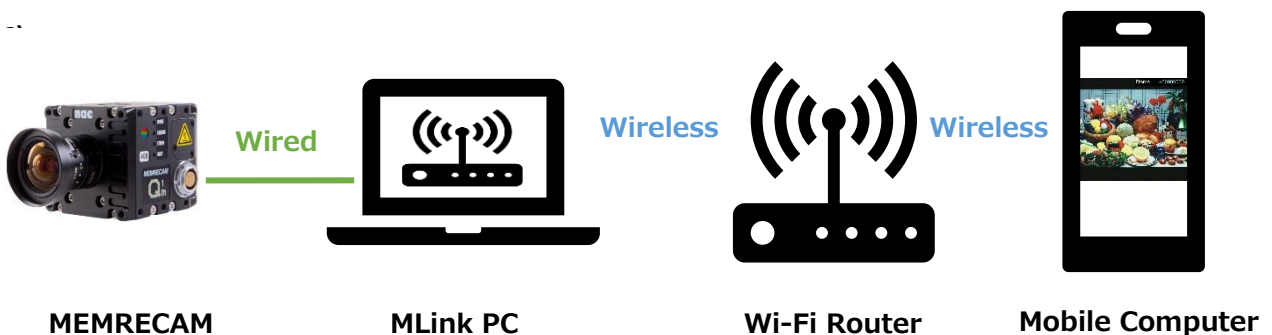
4.2.3 Connection setting

An example of connection is shown below.

- A) An access point is placed in the wired network that is connecting the camera, and it is connected from the mobile terminal to the access point.**



- B) Wi-Fi connection between the camera connected to the Wi-Fi router and the tablet also connects to the router.**



Wi-Fi is recommended for router type. If many connections are made to the router, there is a possibility that communication speed may be reduced. It is recommended to operate with the minimum necessary connection.

In general, wireless LAN products have sufficient security mechanisms. By reading the owner's manual of the wireless LAN product and correctly setting the security, it is possible to reduce the possibility of interception of communication and unauthorized access.

Please understand it and operate it.

Wi-Fi Connection (PC)

When operating in the connection example B) form, please do the following operation

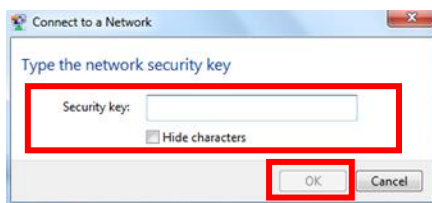
- ② Turn on the Wi - Fi router to be connected.
- ③ Click the network icon on the task bar.



- ④ Select the router to connect and click the Connect button.



- ⑤ Since you are prompted to enter the security key, enter the security key of the router to be connected and click the OK button.



Wi-Fi connection (tablet terminal)

Explain the Wi-Fi connection setting on the mobile terminal side, taking iPhone as an example.

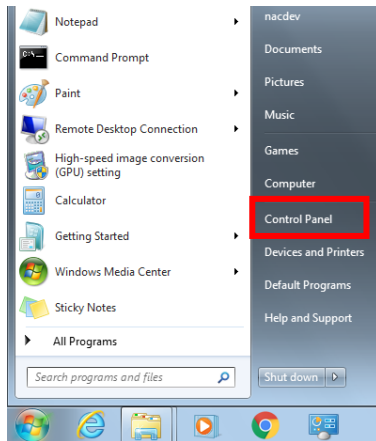
- ① Tap [Settings] on the home screen.
- ② Select [Wi-Fi] and display the network selection screen.
- ③ Select the router to connect.
- ④ Since the password entry screen is displayed,
- ⑤ Enter your password and tap Connect.



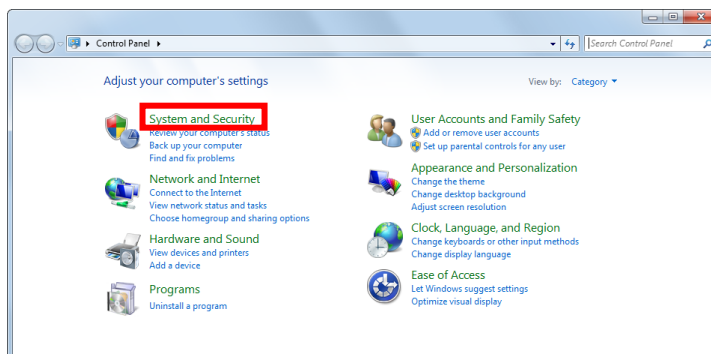
Set up firewall on PC

Explain the setting method using Windows 7 as an example.

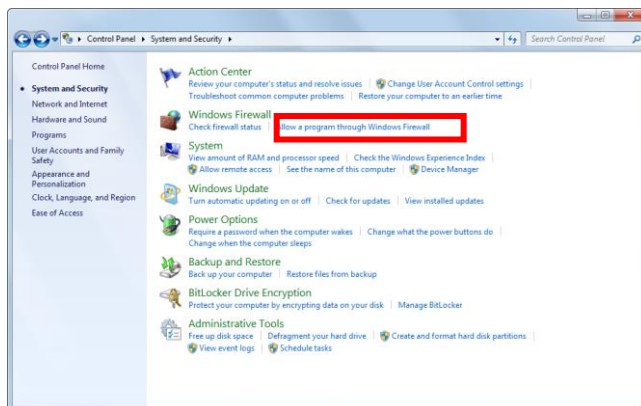
- ① Click [Start] - [Control Panel].



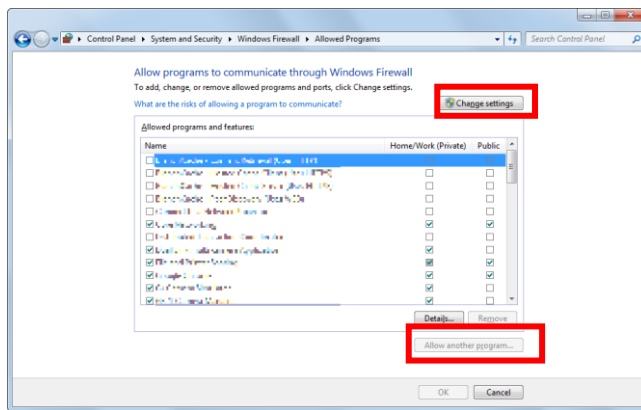
② Click [System and Security].



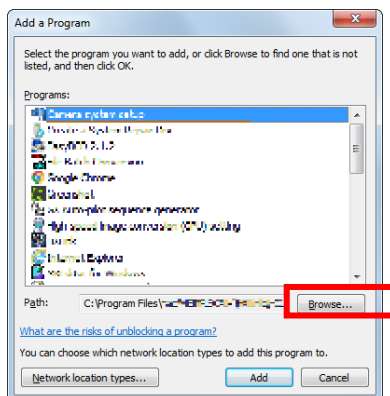
③ Click [Allow the program by Windows Firewall].



④ Click the [Change Settings] button and click the [Allow another program] button.



- ⑤ Click [Browse].



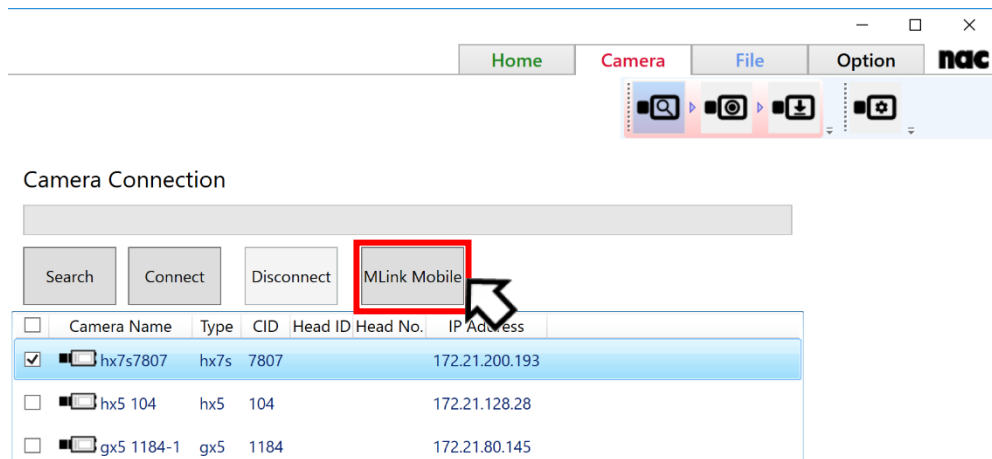
- ⑥ Select "mlpage.node.x64.exe" in the folder where MLink is installed and click the "Open" button. The folders in which MLink is installed are as follows.

C:\Program Files\memrecam\NciaServer

**"MLink Mobile" is a function of only 64-bit version MLink.
It does not correspond with 32 bit version MLink.**

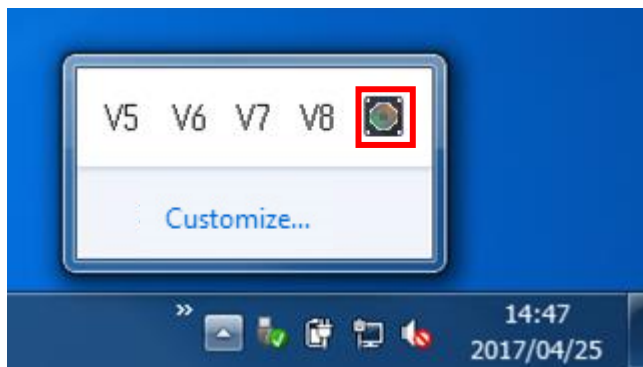
4.2.4 Start MLink Mobile

- ① Activate MLink and display the camera connection screen.
- ② Select the camera you want to connect from the mobile terminal from the list and click the "MLink Mobile" button.



You can connect from a mobile terminal to one camera. Please select one from the camera list and click the "MLink Mobile" button.

"MLink Mobile" starts up, and the mobile terminal enters the access standby state. Icons are displayed on the task bar during startup.



To exit "MLink Mobile", right click on the task bar icon and click "Exit" or quit MLink.

Camera control with MLink can not be performed while "MLink Mobile" is running.

4.2.5 Connect to MLink Mobile from mobile terminal

Launch the browser on the mobile device and enter the URL in the address bar.

例) <http://192.168.200.242:7900/>

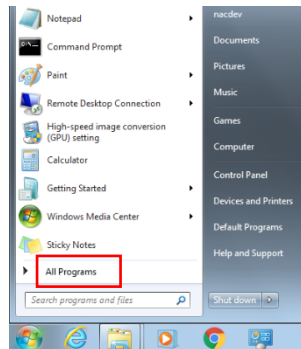


For IP address, please enter the IP address of the PC running "MLink Mobile" on the network connected to the mobile terminal.

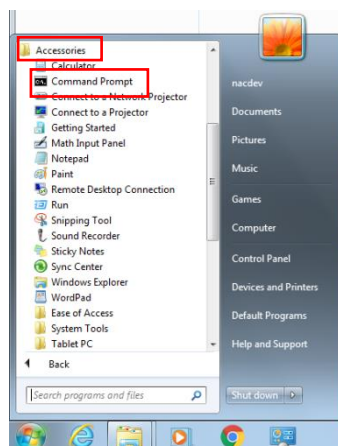
How to check the IP address

Explain how to check the IP address using Windows 7 as an example.

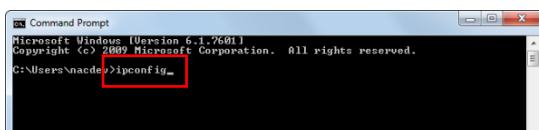
- ① Click [Start] - [All Programs].



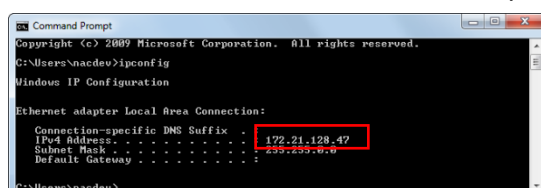
- ② Click [Accessory] - [Command Prompt].



- ③ Enter "ipconfig" and press [Enter] on the keyboard.



- ④ "IPv4 address" is the IP address acquired by the personal computer.



If you are building a wireless network using the access point in connection example A), please use "IPv4 address" displayed under "Ethernet adapter local area connection".

If you are connecting to the router wirelessly from the PC in connection example B), please use "IPv4 address" displayed under "Wireless network connection".

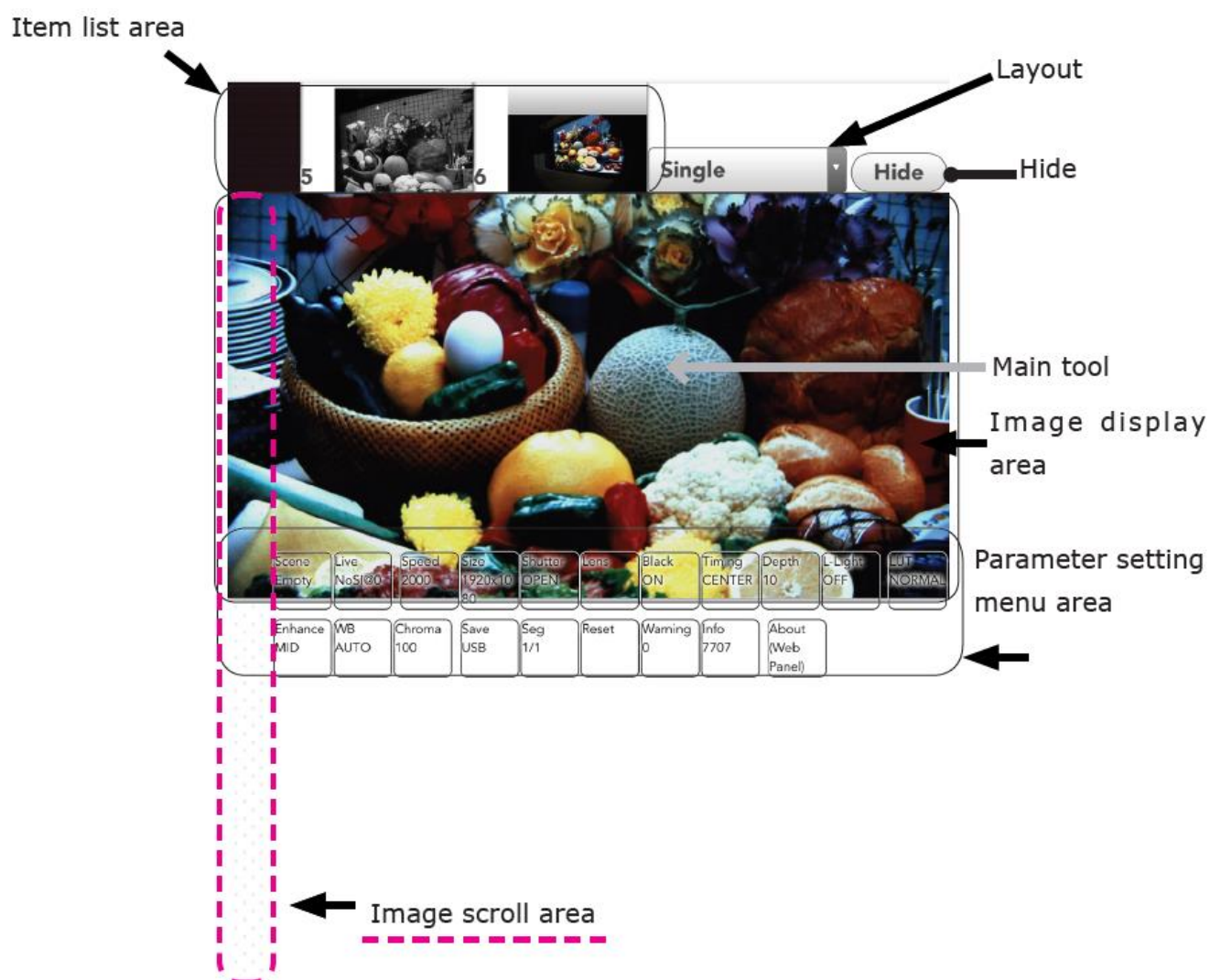
4.2.6 MLink Mobile Explanation of Each Part

When you launch the browser of the mobile terminal and enter the URL in the address bar, MLink Mobile appears in the browser. Displayed screen is common to Web Application names "nac WebPanel" (from now on "WebPanel") that installed in MEMRECAM MX-5.

Explain WebPanel of each part.

These pictures are based on the default GUI settings.

Name of each part of WebPanel

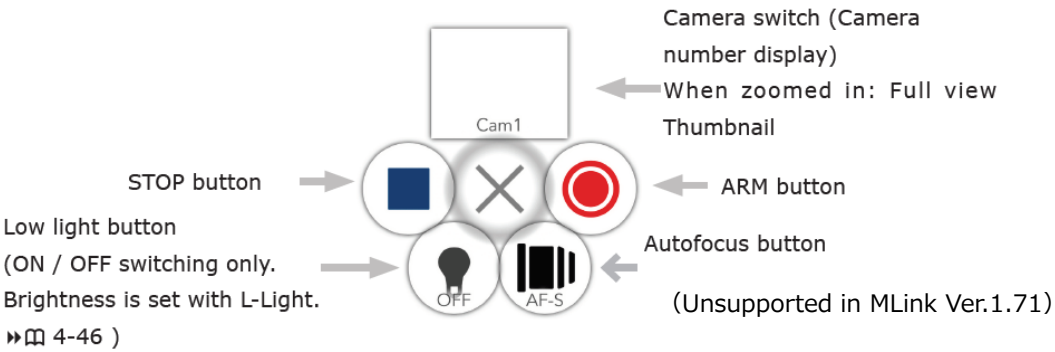


| Name | Explanation |
|--------------------|--|
| Item list area | <p>When multiple camera heads are connected, unselected camera heads are displayed as thumbnails. To switch camera head, please tap the thumbnail.</p> <p>If the layout is set to something other than Single, the connected camera head will be placed in the image display area in port order immediately after specification.</p> <p>By tapping the thumbnail of the item list, the display in the image area is turned on / off, and the order of the layout can be changed.</p> |
| Layout | <p>Sets the layout to be displayed in the image display area.</p> <p>Single Select one camera head.</p> <p>2ch Horizontal Up to two units Display the camera head side by side</p> <p>2ch Vertical Up to two camera heads are displayed vertically.</p> <p>4ch Quad Displays up to 2 x 2 in side by side.</p> <p>4ch Horizontal Displays side by side.</p> <p>4ch Vertical Arranges vertically and displays.</p> <p>8ch Square Display up to 8 units in order from the upper left in 9 divisions (3x3).</p> <p>8ch Horizontal Displayed in order from the upper left in the horizontal 4 × vertical 2 division.</p> <p>8ch Vertical Displayed in order from the upper left in 2 horizontal × 4 vertical division.</p> <p>18ch Vertical Displays in order from the upper left in the 3 horizontal × 6 vertical division.</p> <p>24ch Vertical Displays in order from the upper left in the 4 horizontal × 6 vertical division.</p> |
| Hide | Hide the item list area. |
| Image display area | <p>The image of the selected camera head is displayed in its entirety according to the screen width.</p> <p>Images can be magnified by pinch out.</p> <p>The camera mode is displayed in the upper left, and the information according to the mode is displayed in the upper right. (VIEW / ARM: Recordable time, STOP / PLAY: Frame number)</p> |

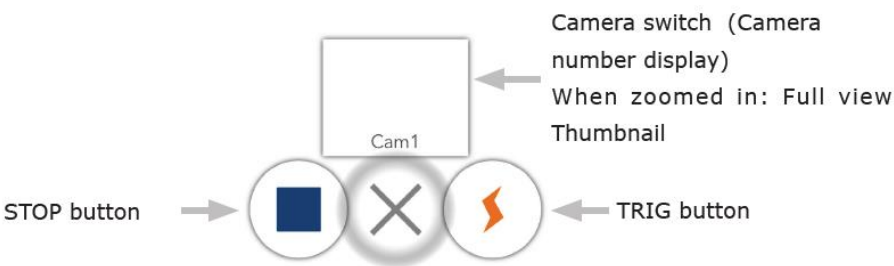
| | |
|-----------------------------|---|
| | To scroll up and down this area itself instead of a menu slide the left edge of the screen (Image scroll area). |
| Main tool | <p>Basic operation is done with buttons arranged in a ring shape.</p> <p>The contents of the button change according to the mode.</p> <p>Tap outside the area to move to that position.</p> <p>Tap the center (×) to hide it, then tap again to redisplay it.</p> <p>It can be used even while enlarging the image.</p> |
| Parameter setting menu area | <p>Each item is normally collapsed into a button, and the current setting value is briefly displayed on it.</p> <p>Button When tapped, the item is expanded, detailed display and setting change are possible. Each item is described after 4-10.</p> <p>The area can be scrolled up and down by sliding and can be superimposed on the image.</p> <p>It is hidden while enlarging the image.</p> |
| Image scroll area | <p>Vertical scrolling of the entire page is possible.</p> <p>When the image display area and the parameter setting menu area overlap, a pattern is displayed.</p> |

Main tool

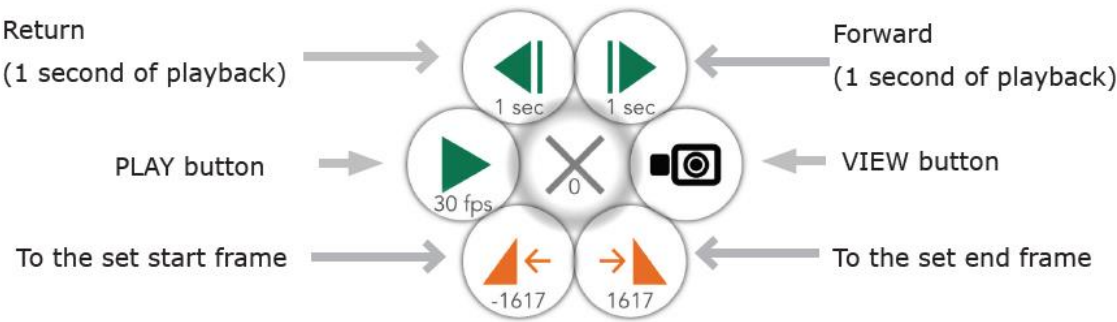
VIEW



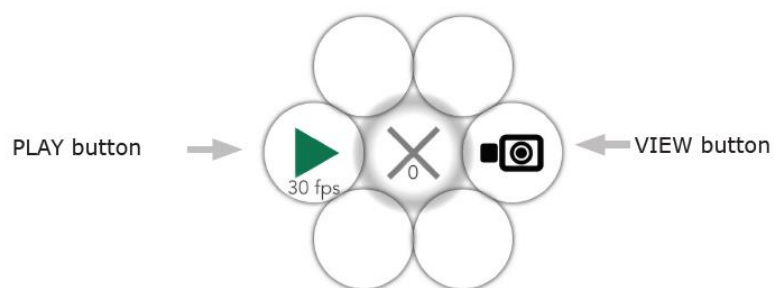
ARM



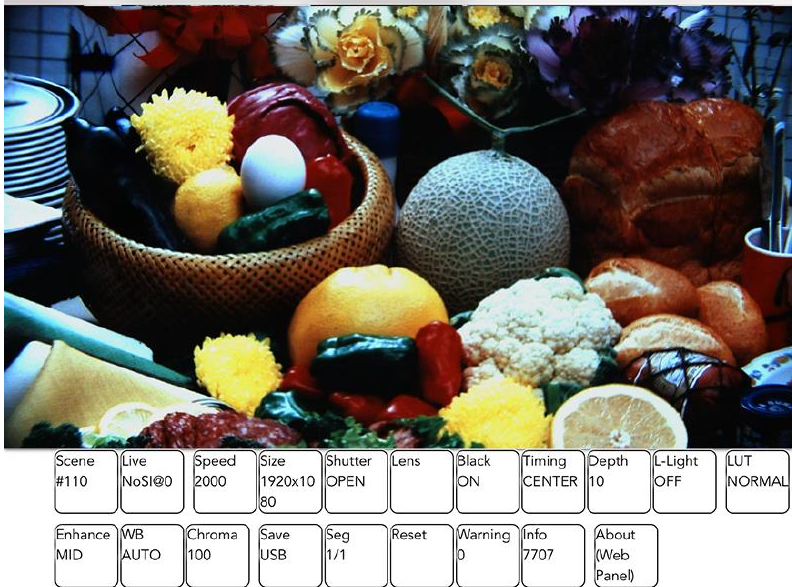
STOP (when there is a recorded image)



STOP (when there is no recorded image)

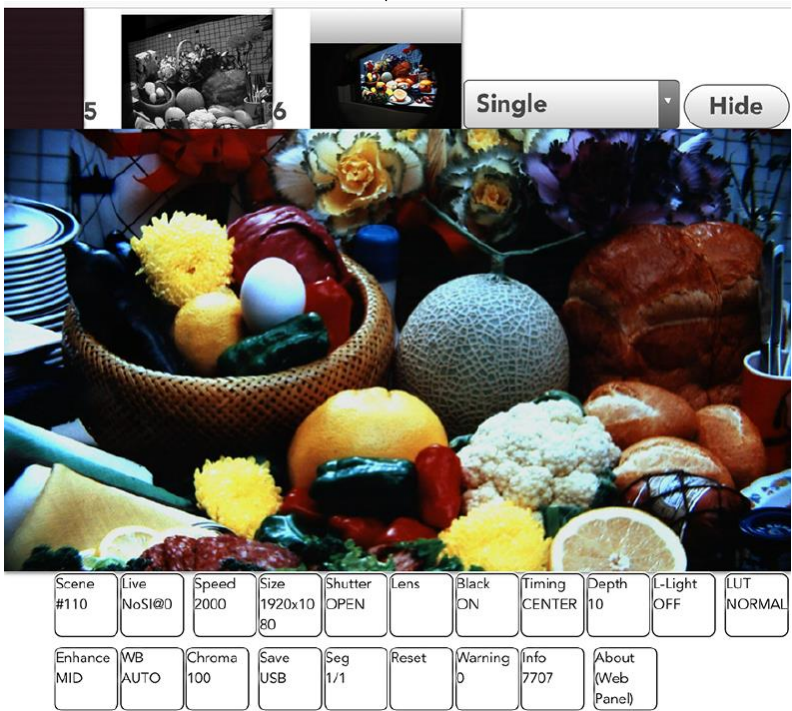


■ To display an item list that was hidden by Hide



1. Slide the image scroll area down while hiding the item list hidden

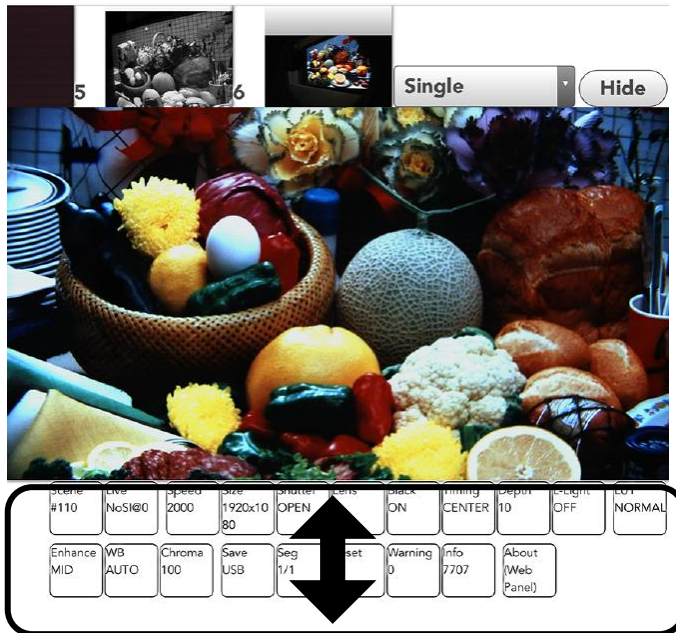
- Slide the image scroll area down (scroll down).
- When the parameter setting menu area and the image display area overlap, it can not slide in the image display area.



2. Item list is displayed

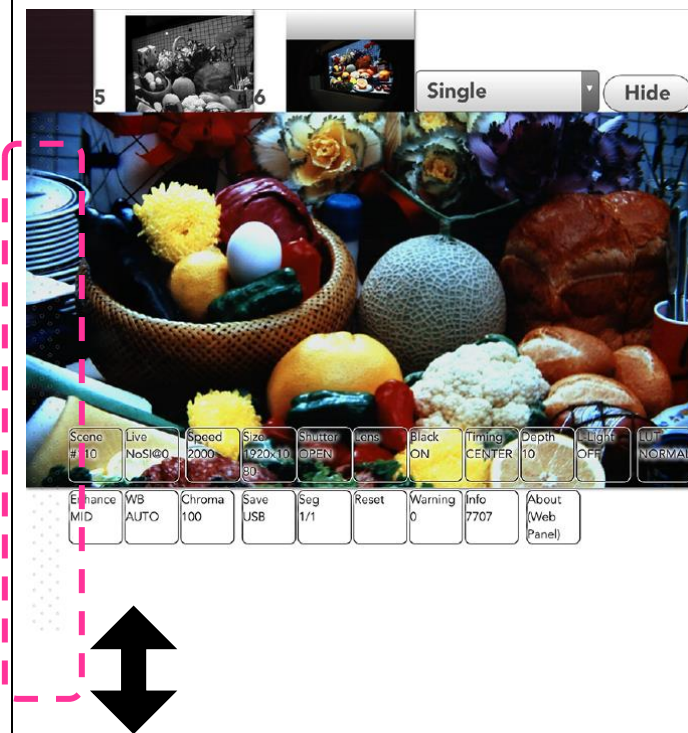
- The item list is displayed.

■ Move parameter setting menu area



Move parameter setting menu area

- The parameter setting menu area can be moved up and down, and it can also be displayed overlying the image display area.
- pattern is displayed in the image scroll area, making it easy to understand the operation location.
- When the overlap between the parameter setting menu area and the image display area disappears, the display of the pattern also disappears.



Parameter setting

Describe the parameters that can be set with WebPanel.

■ Live

Setting of live image display. Various information is displayed superimposed on the live image.

- This function is a unique function of WebPanel, and settings are not saved (except setting in Rotate). Refresh the browser page (reload) to return to the initial setting.
 - Changing the default setting is possible in the customization of the WebPanel (Def :).

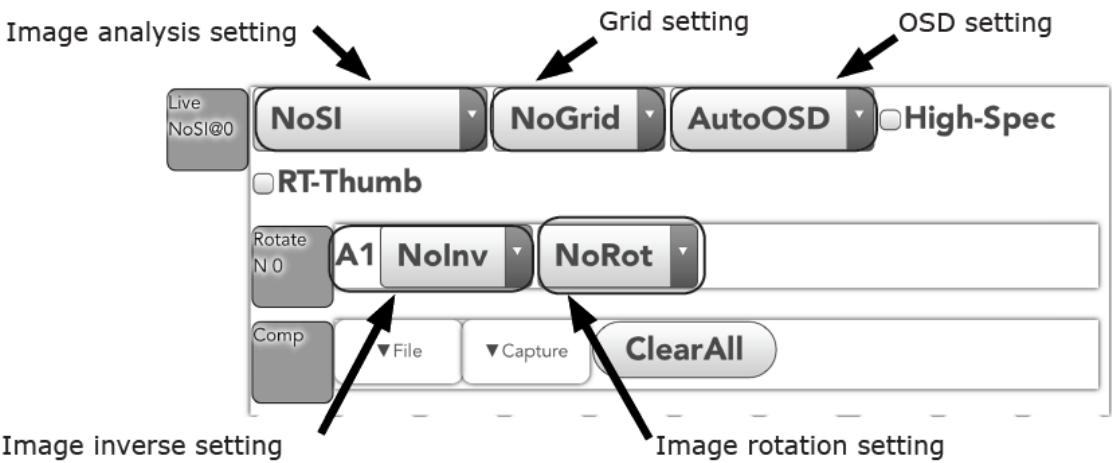


Image analysis setting: Analyze and superimpose on the display image.

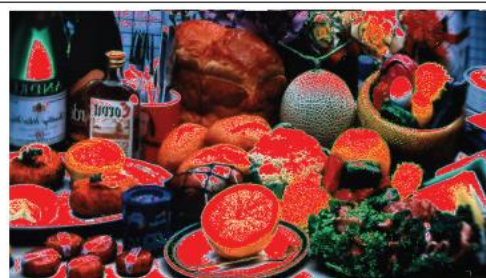
| | | |
|------------------------|--|--|
| NoSI | No information superimposition. | |
| ExpOver | Display the exposure of the image. The underexposed area is displayed in green, and the white jump area is displayed in red. | |
| FocusMap1 FocusMap2 | In-focus map (Focus Peaking) | It indicates whether the subject is in focus or in a different color. The more it gets red, the more it is in focus. FocusMap1 : Red only FocusMap2 : From blue to red |
| AOI(L/F) | Area Of Interest (Luminance/ | It displays up to one place per image. |

| | | |
|-----------|--|---|
| | Focus) | <p>A rectangular area is displayed around the tap location and the average brightness value / focus value / focusing history graph (last 10 seconds) in the area is displayed.</p> <p>The higher the value of the in-focus value, the more the focus is in focus.</p> <p>Since the focusing history graph is displayed so that the current in-focus value becomes the center of the upper and lower sides, in order to focus on it, focus is set so that the peak of the graph is the center Adjust.</p> <p>The area size varies depending on the size of the tablet and the zoom operation (pinch in / out).</p> |
| LineProf | <p>Displays RGB color component values at positions where the screen is bisected up and down.</p> <p>If a line segment is selected in the simple measurement function, the RGB color component values of that line segment are displayed as a graph.</p> | |
| Histogram | Displays the histogram (color tone) of the image. | |
| Hist(RGB) | Displays the histogram (color tone) of red, green, and blue components of the color image. | |
| Average | <p>The average brightness value (0 to 255) is displayed.</p> <p>When combined with the grid setting, the area can be divided.</p> | |

ExpOver

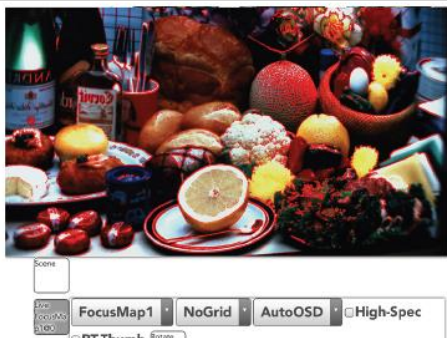


Underexposed



White jump

FocusMap1
FocusMap2

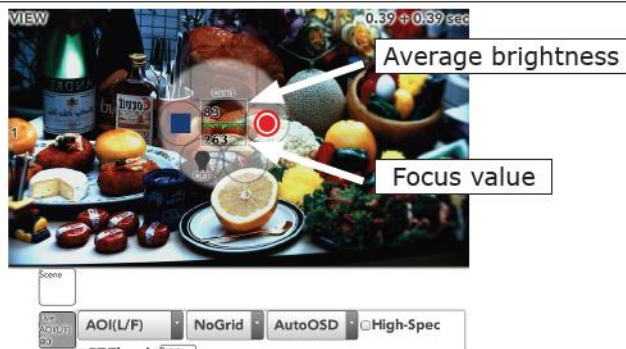


FocusMap1

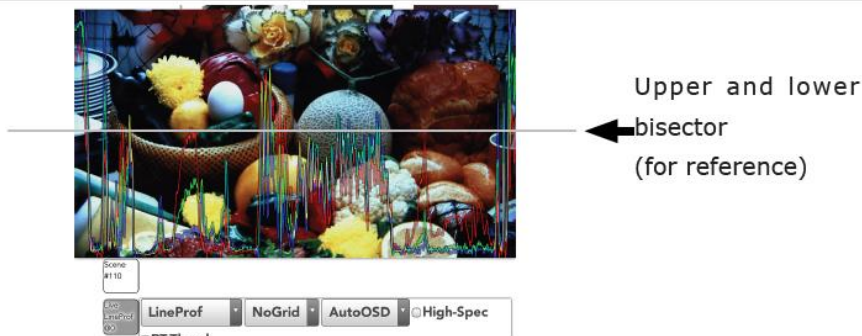


FocusMap2

AOI(L/F)



LineProf



Histogram



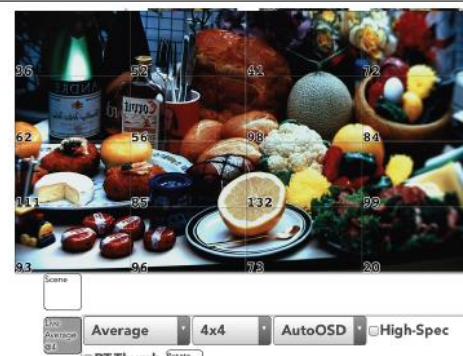
Hist(RGB)



Average



NoGrid



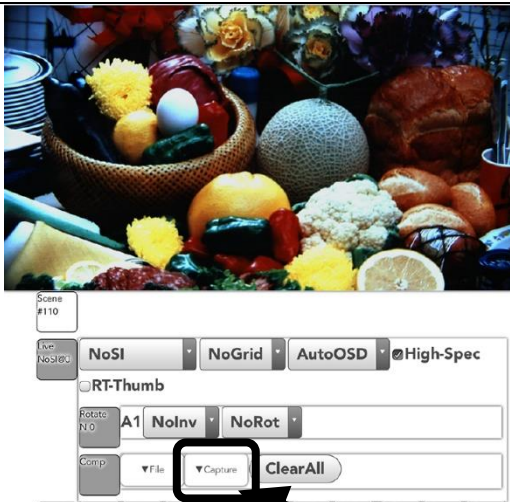
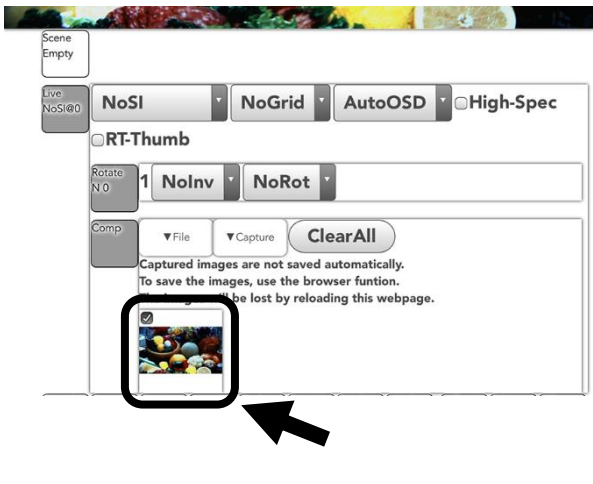
Grid 4x4

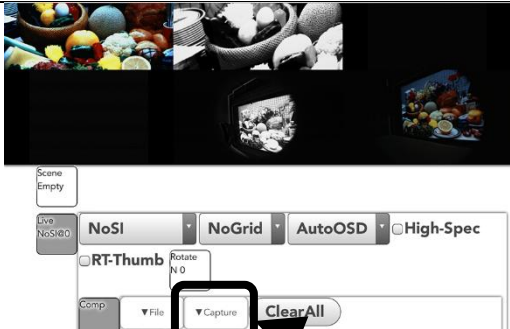
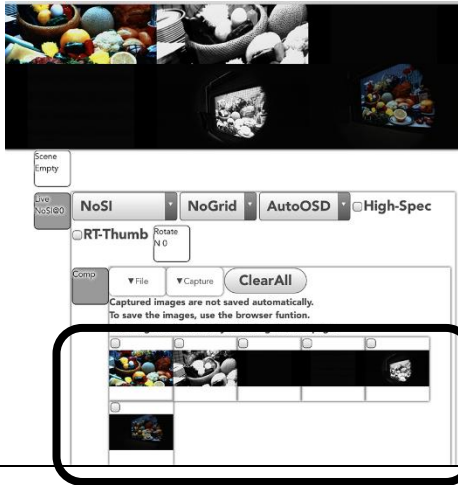
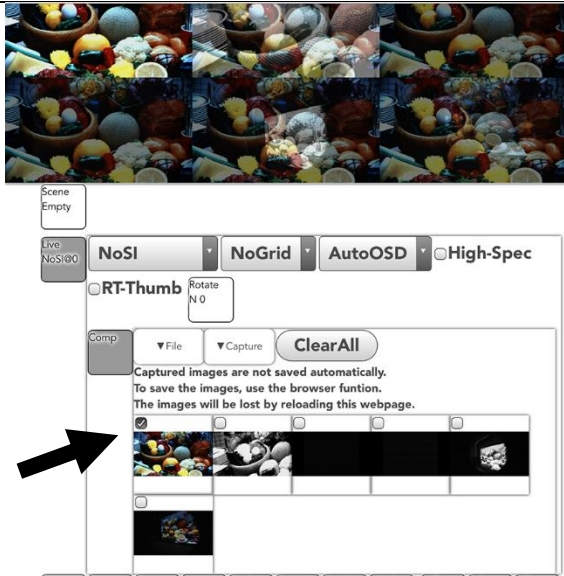
| | |
|--|--|
| Grid setting: Grid is superimposed on the image. | |
| NoGrid | No grid display. |
| 1×1 | Display image boundary |
| 2×2 | The intersection can be used as a conventional image center mark. |
| 3×3 to 32×32 | The grid is displayed with equal division. |
| OSD (On Screen Display): Superimposes setting values etc. (parameters) on the image. | |
| NoOSD | Always hide |
| AutoOSD | Camera mode, the value according to the mode, and port number for each camera, recording speed, recording resolution, the shutter speed will be displayed in conjunction with the display state of the main tools. Recording speed, recording resolution, shutter speed are displayed only when there are cameras with different settings in the multiple camera display. |
| FullOSD | Always display parameters |
| High-Spec | Increase live image update rate. Load processing is troublesome for browser processing. |
| RT-Thumb | Update the thumbnail display of the item list in real time. Live update speed will be lower than usual. |
| Rotate: Expand the invert / rotate image menu. | |
| Image inverse setting: It inverses the display image | |
| NoInv | The image is not inverted / restored to its original state |
| T-B | An image is inverted up and down. |
| L-R | And the left and right reverse the image. |
| TL-BR | Simultaneous upside-down and left-right inversion of the image. |
| Rotation setting: Rotate display image | |
| NoRot | The image does not rotate / restores the original state. |
| 90, 180, 270 | Rotates clockwise with the selected angle. |

| | |
|--|--|
| Comp: Compare the image of the camera head with the still image. | |
| ▼File | Load the image saved in Tablet etc. Multiple images can be loaded into the menu, but one can be applied to comparisons. |
| ▼Capture | Temporarily capture the displayed camera image as a still image. When displaying multiple camera heads, capture the image of each camera. |
| Clear All | Deletes the image loaded in "▼File" and the image loaded in "▼Capture". |

- There is no function to save captured images automatically. Save the image with the tablet browser feature.
- The captured image is discarded when the browser reloads. Please save the required image. The image read in the file will also be discarded, so please load the file again.

Capture the image (in the case of one camera)

| | |
|---|---|
|  | <p>1 Display the image of the camera head to capture and click capture</p> <ul style="list-style-type: none"> • Select and display the camera head to capture. • Click "Capture" to capture a still image. |
|  | <p>2 As the captured image is displayed in the area, save as necessary</p> <ul style="list-style-type: none"> • The captured image is displayed in the area. • Please save the image using the browser function. <p>Example)</p> <ul style="list-style-type: none"> • In iOS (Safari), long-press the image in the area and tap "Save Image". • In the case of Microsoft Edge, right-click the image in the area, click "Save as ..." and specify the save file name. |

| | |
|---|--|
| Capture the image (for multiple cameras) | |
|  | <p>1 List the camera heads and click capture</p> <ul style="list-style-type: none">• The figure shows six camera heads.• Click Capture to capture a still image. |
|  | <p>2 As the captured image is displayed in the area, save as necessary</p> <ul style="list-style-type: none">• The capture image is displayed in the area.• Please save the image using the browser function. |
| Select images to compare | |
|  | <p>1 Select the image loaded in "File" or "Capture" by clicking the checkbox</p> <ul style="list-style-type: none">• The image is an example comparing the captured image of Cam1 with the images of all camera heads.• Only one image can be selected. |

■ Meas (displayed by customizing Web Panel)

Simple measurement can be performed on WebPanel.

- Actual size setting
- 2 points distance
- 3 point angle
- 2 line (4 points) angle

- **Measurement menu can be displayed by customizing WebPanel.**
- **The setting result is initialized by reloading the screen (web page).**
- **There is no function to output the result of this function. Use the screen save function of tablet etc.**
- **Each numerical value display is to the first decimal place.**

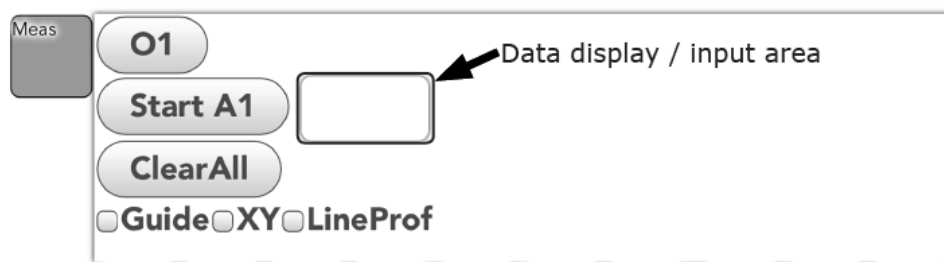
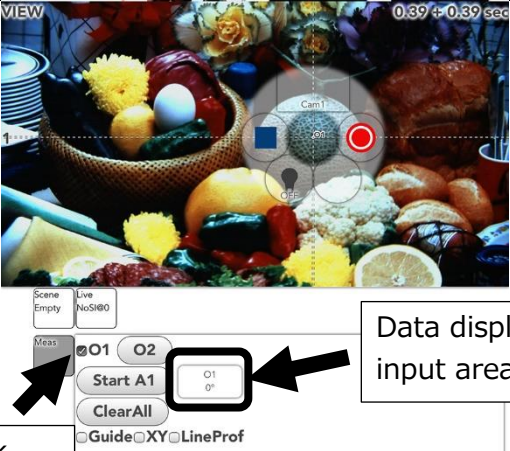


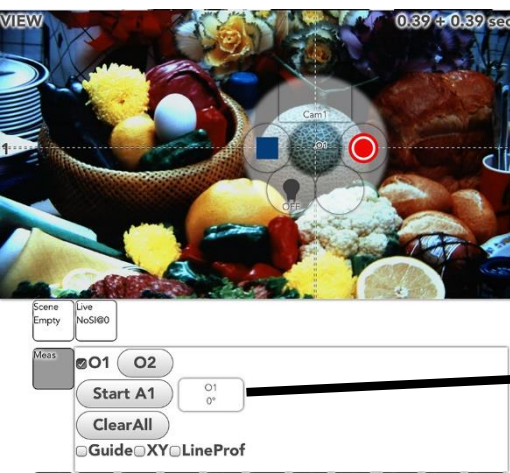
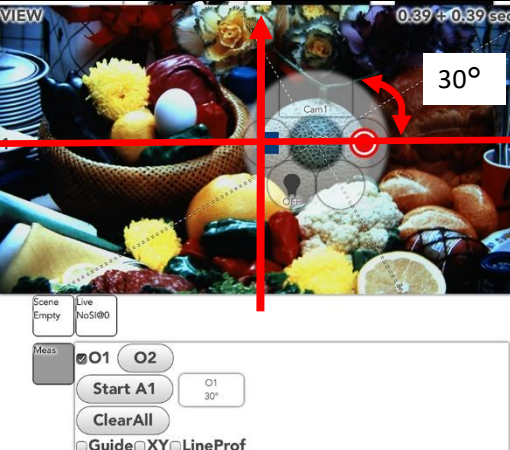
Image analysis settings: Analyze and superimpose on the displayed image.

| | |
|---------------------------|---|
| O1 | Reference point: Display the reference point and crosshairs in the image display area. Multiple settings are possible. |
| Start A1 | Measurement point: Sets the measurement point. Start from A1. It becomes the setting of the continuous line from A1. After setting A point, you can set another independent line segment with "Start B1". |
| Data display / input area | The values etc. displayed in this area can be changed. |
| Clear All | Erases all set reference points and measurement points. |
| Guide | Displays a guide perpendicular to the line between the two points. |
| XY | Displays the display numerical value separately for X and Y coordinates. |
| LineProf | Display a line profile of a line between two points. |

Set reference point

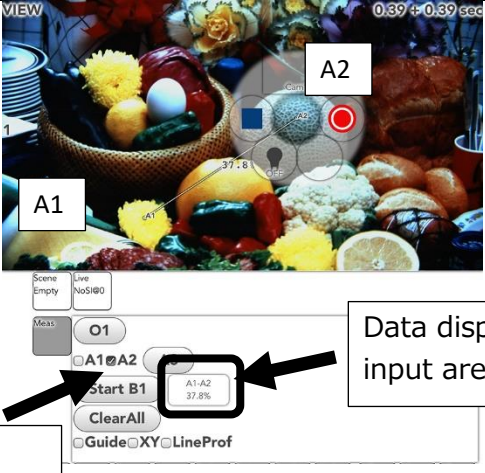
| | |
|---|--|
|  <p>VIEW</p> <p>0.39 + 0.39 sec</p> <p>Cam1</p> <p>0°</p> <p>Scene Empty Live NoSi@0</p> <p>Meas</p> <p>O1 O2</p> <p>Start A1</p> <p>ClearAll</p> <p>Guide XY LineProf</p> <p>Check box</p> <p>Data display / input area</p> | <ol style="list-style-type: none"> 1 Tap O1 and slide the main tool to confirm <ul style="list-style-type: none"> • Even after the decision, you can move the reference point by selecting the check box. • When O1 is selected, the angle displayed in the data display / input area is the angle based on the horizontal and vertical of the display screen (the angle is 0 °). |
|---|--|

Rotate the reference point

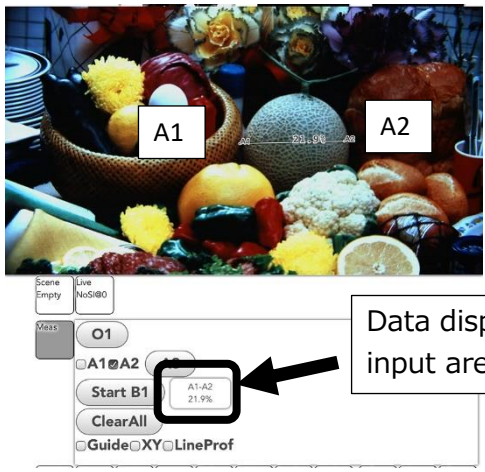
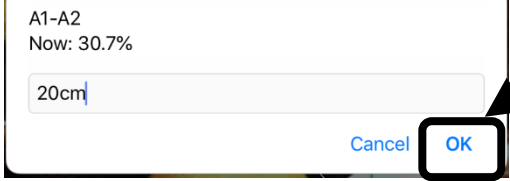
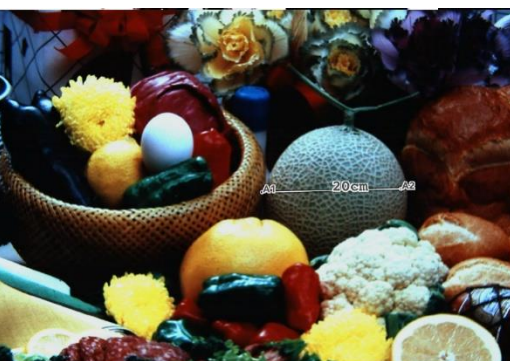
| | |
|--|---|
|  <p>VIEW</p> <p>0.39 + 0.39 sec</p> <p>Cam1</p> <p>0°</p> <p>Scene Empty Live NoSi@0</p> <p>Meas</p> <p>O1 O2</p> <p>Start A1</p> <p>ClearAll</p> <p>Guide XY LineProf</p> | <ol style="list-style-type: none"> 1 Tap O1 and slide the main tool to determine the reference point <ul style="list-style-type: none"> • Tap the data display / input area and enter the angle. <div data-bbox="957 1131 1388 1299"> <p>O1</p> <p>Now: 0</p> <p>30</p> <p>Cancel OK</p> </div> |
|  <p>VIEW</p> <p>0.39 + 0.39 sec</p> <p>Cam1</p> <p>30°</p> <p>Scene Empty Live NoSi@0</p> <p>Meas</p> <p>O1 O2</p> <p>Start A1</p> <p>ClearAll</p> <p>Guide XY LineProf</p> | <ol style="list-style-type: none"> 2 Crosshair rotates counterclockwise with respect to horizontal and vertical of image |

- The angle you entered is also retained in Clear all. To perform a new measurement, select O1 again and enter "0" in the data display / input area.

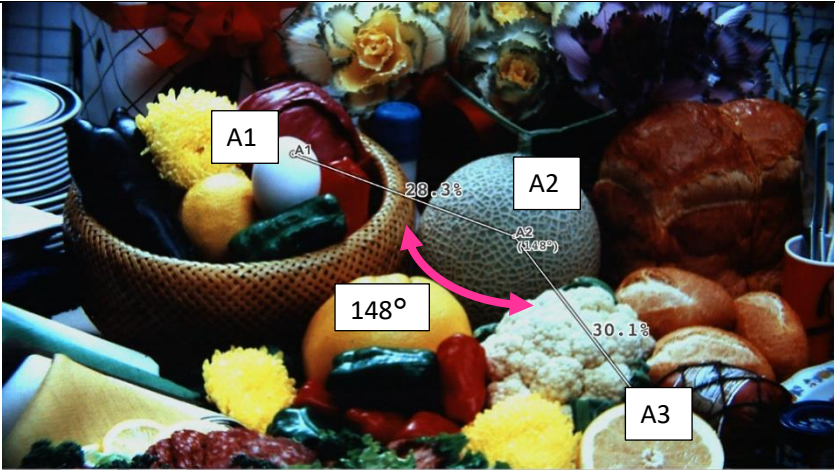
Draw a line at 2 points

| | |
|---|---|
|  <p>Check box</p> <p>Data display / input area</p> | <ol style="list-style-type: none"> 1 Tap A1 to determine the position, and then set A2 to draw a line connecting the two points <ul style="list-style-type: none"> • Even after the decision, you can move the point by selecting the check box. • The percentage display shown in the data display / input area is the value based on 100% of the width of the entire screen (web page). The unit of this value and length can be changed by tapping the data display / input area. |
|---|---|

Set the reference length

| | |
|---|--|
|  <p>Data display / input area</p> | <ol style="list-style-type: none"> 1 Set the reference when the length of the object to be measured is determined. <ul style="list-style-type: none"> • An example draws the straight line of A1-A2 according to the diameter of the melon of a picture. • Tap the data display / input area. |
|   | <ol style="list-style-type: none"> 2 Enter numbers and units <ul style="list-style-type: none"> • In the example, enter the number as the diameter of the melon is 20 cm and tap "OK". • The values and units entered in the image are reflected. This also allows you to measure the size of objects in other images (but only for objects of the same depth). |

Draw 2 lines with 3 points and measure the inside angle



Scene
Empty

Live
NoSI@0

Meas

O1

☐ A1 ☐ A2 ☒ A3 ☐ A4

Start B1

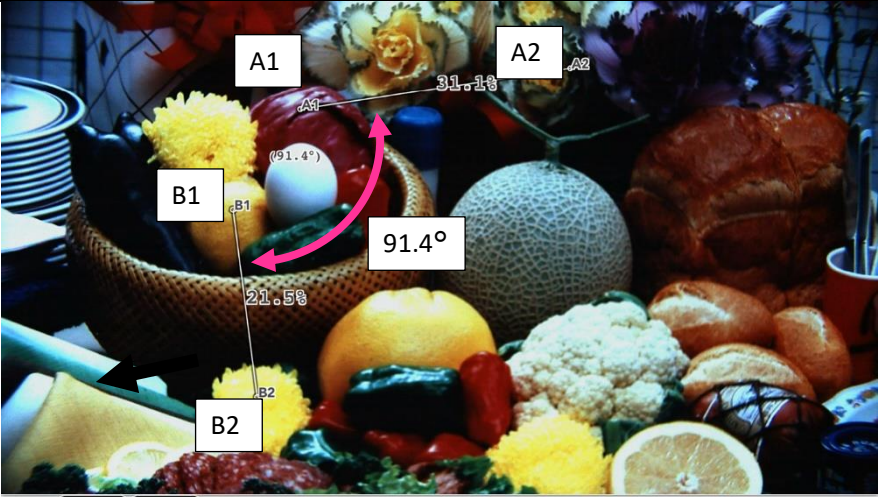
A2-A3
30.1%

ClearAll

☐ Guide ☐ XY ☐ LineProf

- 1 Following A2, setting A3 draws a line connecting two points.
The inner angle of A1-A2 and A2-A3 is displayed

Measure the angle between 2 lines (4 points)



Scene
Empty

Live
NoSI@0

Meas

O1

☐ A1 ☐ A2 ☐ A3

☐ B1 ☒ B2 ☐ B3

Start C1

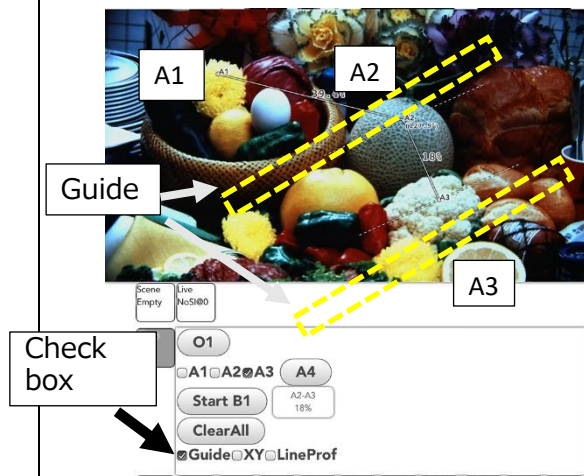
B1-B2
21.5%

ClearAll

☐ Guide ☐ XY ☐ LineProf

- 1 If A1-A2 is followed by B1-B2, two lines and their inner corners are drawn

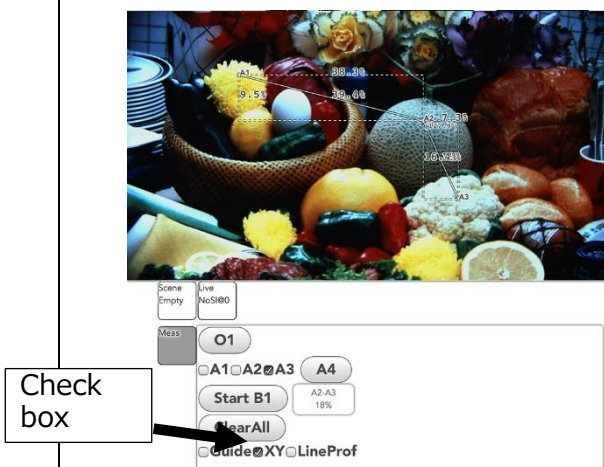
Guide



1 By selecting the "Guide" check box, guides will be displayed perpendicular to the line segment at the two drawn points.

- When you draw a line segment with three or more points, a guide is displayed on the line connecting the selected point and the point immediately before it. In the example, A3 is selected, so a guide is displayed on the A2-A3 line segment.
- After drawing a line segment on the diameter of a circle, it can also be used as a tangent to a circle for measurement support.

XY

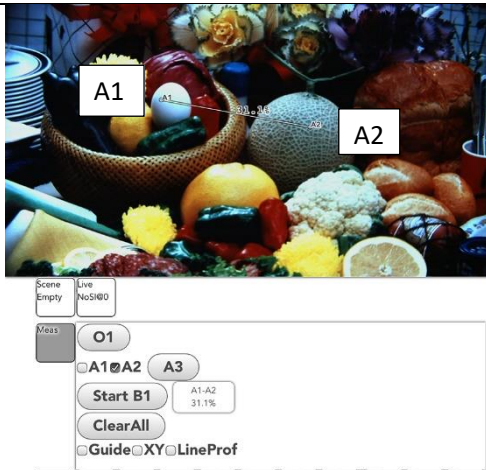


1 By selecting the "XY" check box, the length of the drawn line segment is displayed separately in the horizontal and vertical components of the screen

- The values in the X direction (horizontal direction on the screen) and in the Y direction (vertical direction on the screen) correspond to the value set in "Set reference length".

- In the example, the standard length is not set.
- This value is based on 100% of the width of the entire screen (web page)

LineProf

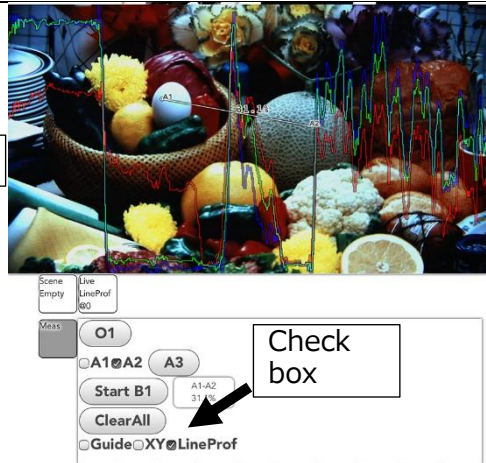


The screenshot shows a software interface for measuring a line segment in a 3D scene. The top part displays a 3D rendering of a fruit basket with two points, A1 and A2, marked on it. A line segment connects them. Below the rendering is a control panel with the following elements: a 'Scene' dropdown set to 'Empty', a 'Live' checkbox checked, a 'NoSIBO' checkbox checked, a 'Measure' button, a 'Start B1' button, a 'ClearAll' button, and a 'Guide' checkbox checked. The 'LineProf' checkbox is unchecked. The 'A1-A2' label shows a distance of 31.1%.

- 1 Specify the line segment of the point to be measured

- In the example, start point A1 and end point A2 are specified as the line segment to be measured.

A1



This screenshot is similar to the first one, but the 'LineProf' checkbox in the control panel is now checked. A line profile graph, showing the RGB color component, is overlaid on the 3D scene, extending from point A1 to point A2. An arrow points to the 'LineProf' checkbox, which is labeled 'Check box'.

A2

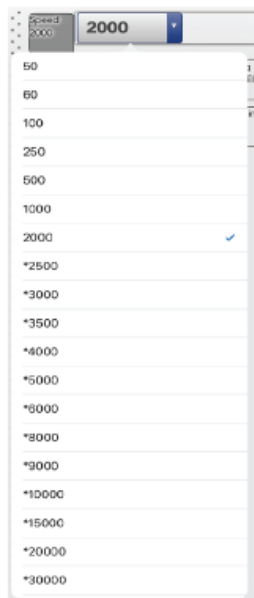
- 2 Selecting the "LineProf" check box displays a line profile (RGB color component) graph from the specified start point to the end point

- In the example, the line profile graph from A1 to A2 is displayed from left to right.

■ Speed/Size

Set the framerate / resolution.

Speed



Size

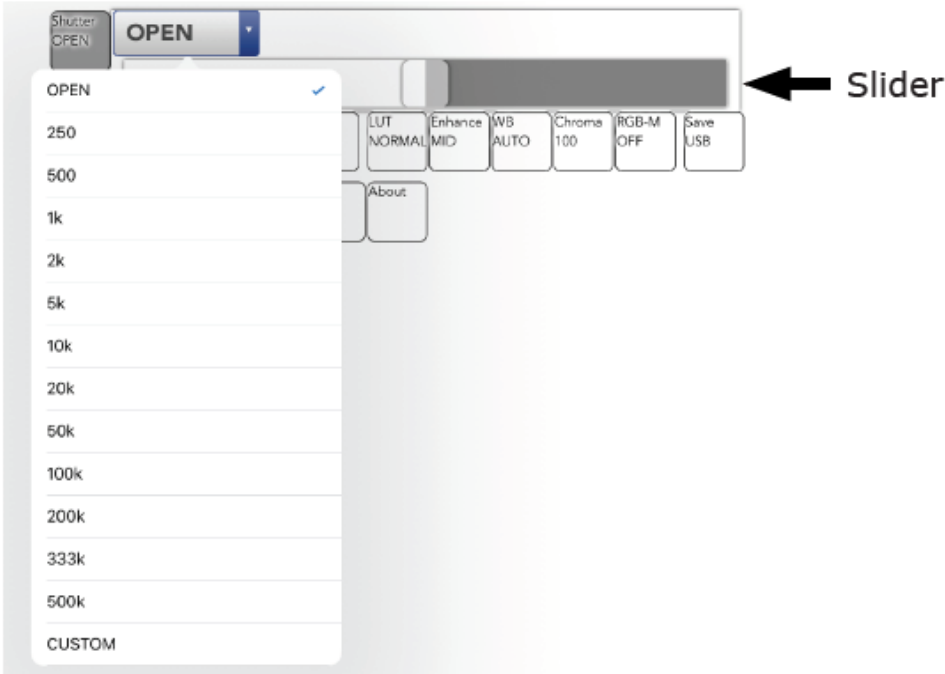


| | |
|----------------------------|---|
| Speed | Select framerate. |
| Size | Select resolution. |
| The choice "*" (asterisk)" | Those with * (asterisk) attached can not be set with the value as it is. Changing one will change the other. Example) If Speed is 5,000 fps and you select Size "* 1920 × 1080", Speed will be changed to 2,000 fps. |
| The choice "--- (hyphen)" | It means that it can be set only with another camera head Example) M2-Cam can set 1,500 fps, but M-Cam has 1,500 fps can not be set. When only M-Cam is selected, "1,500" is displayed as "- - (hyphen)". |
| The choice "?" (Question)" | The one with "?" (Question mark) means that it can not be set all together when multiple cameras are selected. Example) M2-Cam can be set by the 1,500fps but, M-Cam can not be set is 1,500fps. When both cameras are selected with Quad, and Speed "1,500" is selected, the setting is changed only for M2-Cam. |

When using black balance, please take black balance after setting change.

■ Shutter

Set the shutter speed.



| | |
|--|--|
| OPEN | Set it to open. |
| Preset value (Example: 250 to 500k) | Set the shutter with the preset value. |
| CUSTOM | Set the shutter manually with numeric input or slider. |
| Slider | When CUSTOM, slide left and right to set the shutter. |

CUSTOM(Numerical input)

Shutter: CUSTOM
Now: 999us (1/1001)
Range: 1.1us to 999us

500us

CancelOK

Numerical value (μs) Input

Shutter: CUSTOM
Now: 500us (1/2000)
Range: 1.1us to 999us

1/1000

CancelOK

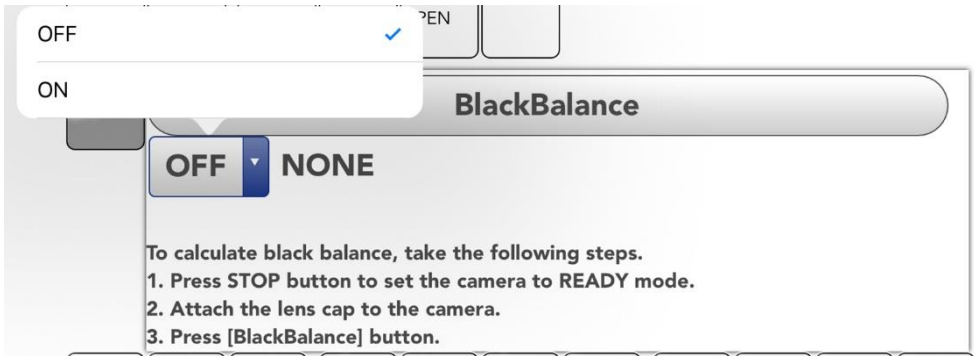
Numerical value (fractional seconds) input

- Even if CUSTOM's numeric input is canceled, it will be in the CUSTOM state. Please select the preset value again.
- When using black balance, please take black balance after setting change.
- If low light is ON, the display image will not change even if the shutter setting is changed. Please turn off low light when checking.

■ Black

Set the black balance.

- **When adjusting black balance with cameras other than HX, ACS, and GO cameras that do not have a mechanical shutter, be sure to attach the lens cap to block light. After recording, please do not take black balance before saving data.**
- **When acquiring black balance, set the layout to Single and select the corresponding camera.**



| | |
|--------------|---|
| ON/OFF | Set enable / disable of calculated black balance. |
| BlackBalance | Tap to calculate black balance. Be sure to execute in STOP mode or VIEW mode. NONE: Black balance is not calculated yet. BUSY: Black balance is in progress. Please wait a minute. VALID: Black balance has been calculated. |

■ Timing

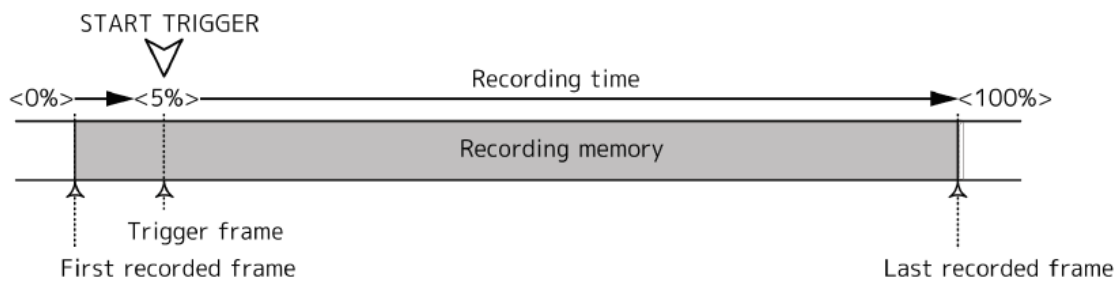
Sets the trigger timing.



| | |
|--------|-----------------------------|
| START | Set it as a start trigger. |
| CENTER | Set it as a center trigger. |
| END | Set it as an end trigger. |
| CUSTOM | Set it as a custom trigger. |

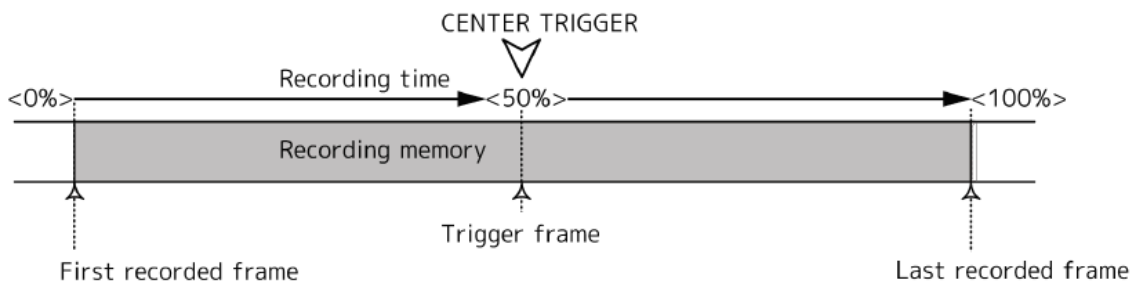
Start trigger

With the Start Trigger 95% of the record time from the trigger input to the end of recording can be recorded. The Start Trigger is used when recording an event that starts immediately after the trigger is input.



Center trigger

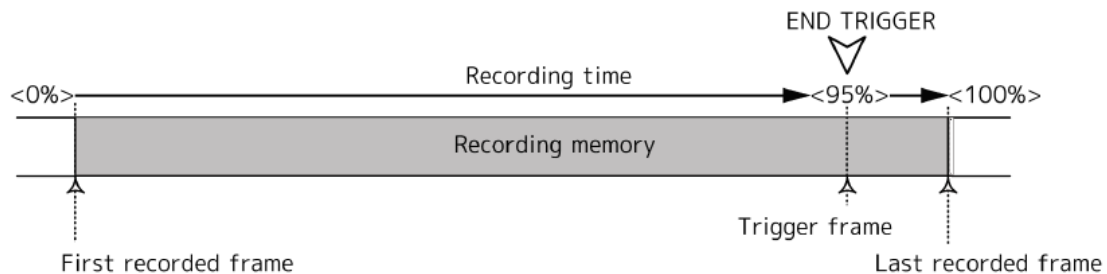
With the Center Trigger half of the recording time is recorded before and after the trigger input. The Center Trigger is used when recording an event that requires both pre and post images after the trigger is input.



End trigger

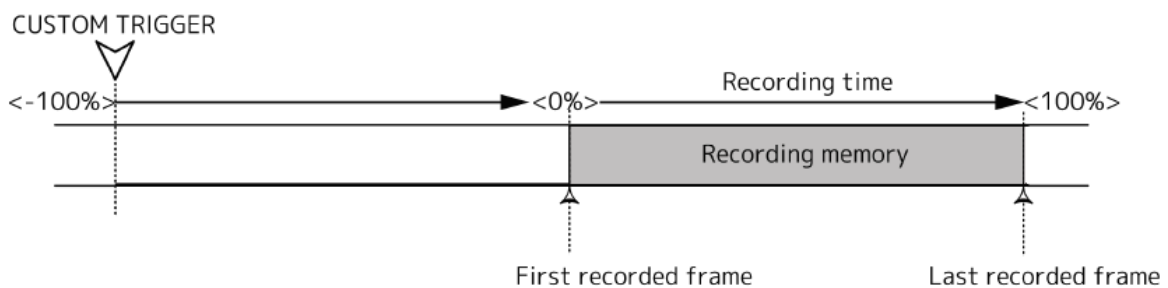
With the End Trigger 95% of the record time is recorded from the start of recording to trigger input.

Use the End Trigger when recording an event that ends when the trigger is input.



Custom Trigger

In the case of a custom trigger, when a positive number is set, the number of frames recorded from the start of recording to the input of the trigger and the number of frames recorded from the trigger input until the end of the recording are set at an arbitrary ratio (% or frame number) It is possible to set. The example in the figure is when the trigger timing is set to -100%.



CUSTOM (Numerical input)

Timing: CUSTOM
Now: 0 (0%)
Range: -3234 to 3234

Cancel OK

Numerical value (number of frames) input

Timing: CUSTOM
Now: 0 (0%)
Range: -3234 to 3234

Cancel OK

Percentage input

- When multiple cameras are selected, settings are made for all selected cameras.
- For the number of frames input, the number of common frames is set.
- For percentage input, the number of frames is set based on the percentage of each camera.

■ Depth

Set the recording bit length.



| | |
|----|---|
| 8 | 8 bits: The upper 8 bits of the output of the image sensor section are recorded, and the lower 2 bits are not recorded. Long time recording, data size shrink. |
| 10 | 10 bits: Image sensor section output 10 bits are recorded as it is. Standard image quality. |
| 12 | 12 bits: Can not be use. |

■ L-Light

At the set frame rate, bright vivid live images may not be obtained in VIEW mode. When using the "low light" function, an image brighter than the recorded image at the set recording speed is displayed, and it is easy to check the angle of view and focus.

- **Low light function is effective only for image display in VIEW mode. There is no influence on image display in ARM mode, REC mode, and video to be actually recorded. The actual recording is taken at the set recording speed.**
- **ON / OFF switching can be performed by tapping the low light button of the main tool in VIEW.**

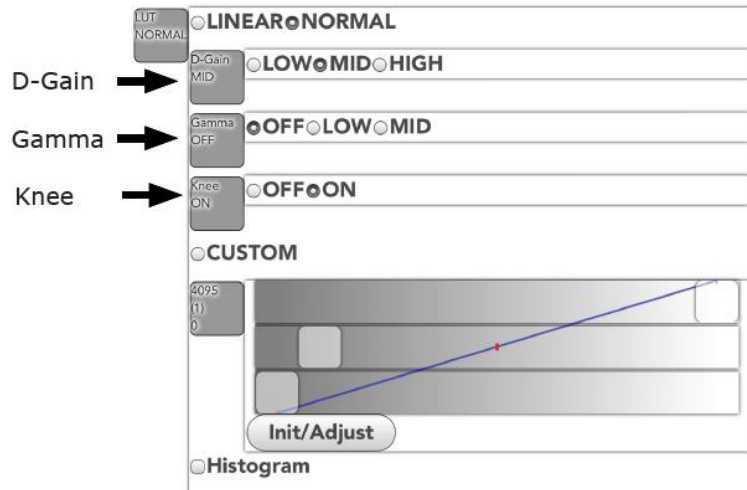


| | |
|-----|--|
| OFF | Turn low light mode off. |
| ON | Turn on low light mode. |
| 100 | Display live image with 1/100 second exposure time (Frame rate 100 fps, equivalent to shutter OPEN) |
| 250 | Display live image with 1/250 second exposure time (Frame rate 250 fps, equivalent to shutter OPEN) |
| 500 | Display live image with 1/500 second exposure time (Frame rate 500 fps, equivalent to shutter OPEN) |

| | |
|------|--|
| 1000 | Display live image with 1/1000 second exposure time (Frame rate 1000 fps, equivalent to shutter OPEN) |
|------|--|

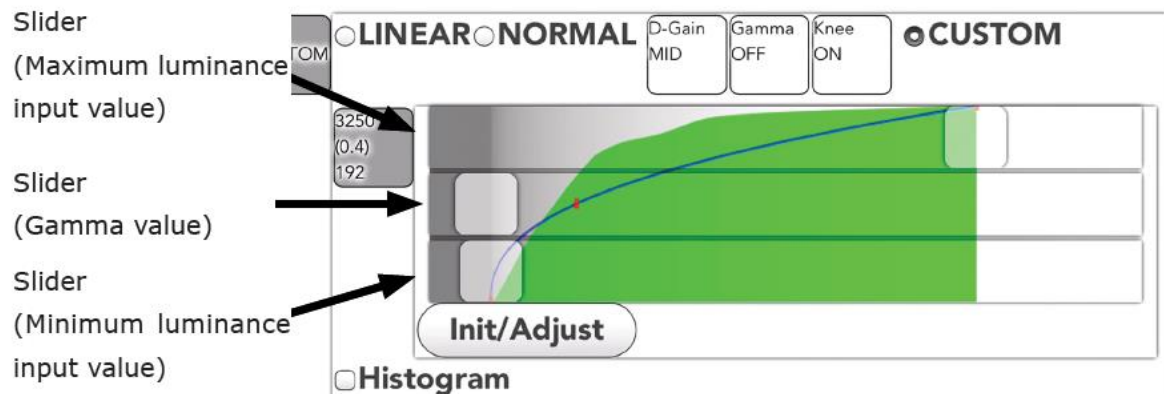
■ LUT

Sets the luminance characteristics of the image. Set the digital gain, gamma, knee.



| | |
|--|---|
| LINEAR | <p>Correlate linearly from the recorded luminance to the display luminance.</p> <ul style="list-style-type: none"> •When the recording bit length is 8 bits, set the recording luminance "0 to 255" to the screen gradation "0 to 255" (1 time) •When the recording bit length is 10 bits, set the recording luminance "0 to 1023" to the screen gradation "0 To 255 " (1/4 times) •When the recording bit length is 12 bits, set the recording luminance "0 to 4095" to the screen gradation "0 To 255 " (1/16 times) |
| NORMAL | <p>Adjust the display brightness with the gain (D-Gain), gamma (Gamma) and knee (Knee) which are general parameters for adjusting the image quality of video and monitor.</p> <p>Example: Recording bit length 10 bits, digital gain LOW, gamma OFF, knee OFF</p> <p>Convert recorded brightness "0 to 511" to screen gradation [0 to 254] (1/2 times)</p> <p>Convert recorded brightness "512 to 1023" to screen gradation [255] (display saturation)</p> |
| D-Gain: Expand the menu of digital gain (amplification). | |
| LOW | Sensitivity one step less than MID. |
| MID | Set to MID (standard). |
| HIGH | Sensitivity one step higher than MID. |
| Gamma:Expand the gamma (brightness) correction menu. | |
| OFF | No gamma correction. |

| | |
|--|----------------------------|
| LOW | Low gamma correction |
| MID | Standard gamma correction. |
| Knee:Expand the knee (white collapse) correction menu. | |
| OFF | No knee correction. |
| ON | Knee correction. |



CUSTOM: Ignore the setting of digital gain · gamma · knee and display the image with custom parameters

Slider

| | |
|-------------------------------|--|
| Minimum luminance input value | Specify the luminance input value to represent black. (Range: 0 to 4095, initial value: 0) |
| Gamma value | It is used to make input / output characteristics nonlinear. (Range: 0.1 to 10.0, initial value: 1.0) |
| Maximum luminance input value | Specify the luminance input value to represent white. (Range: 0 to 4095, initial value: 4095) |

The outside of the set luminance input value is displayed as a blackout or a white overexposure.

- When the relationship between the value of "minimum luminance input value > maximum luminance input value", and negative-positive reversal.
- When the gamma value is 1.0, the characteristic is linear (linear).
- When the gamma value is decreased, the appearance of the dark area is emphasized.
- When the gamma value is increased, the appearance of the bright part is emphasized.

Graph

| | |
|--|---|
| Setting value graph display | The output pixel value (vertical axis) relative to the input pixel value (horizontal axis) is displayed as a blue line in the graph. |
| Cumulative frequency graph display (Only when CUSTOM is selected) | The graph with the histogram integrated is displayed with a green fill. In order to obtain an appropriate dynamic range, adjust the shape of the setting value graph so that it approaches the cumulative frequency graph as much as possible. |

| | |
|-------------|---|
| Init/Adjust | Luminance characteristics CUSTOM auto adjustment button •If the current value is not the initial value, return to the initial value (linear equivalent). •If the value is already the initial value, automatic adjustment is performed based on the currently displayed image. (Only when CUSTOM is selected) |
| Histogram | Display the histogram. It is the same as Histogram in the Live menu. |

■ Enhance

Set up enhance (emphasize contours).



| | |
|------|---------------------------|
| OFF | Do not emphasize contours |
| LOW | Low contour emphasis |
| MID | Normal contour emphasis |
| HIGH | High contour emphasis |

■ WB

Set the White Balance



| | |
|------|--|
| AUTO | Auto white balance |
| 3100 | When the color temperature of the light source is 3100K. |
| 5000 | When the color temperature of the light source is 5000K. |
| 9000 | When the color temperature of the light source is 9000K. |
| REG | Set the white balance data manually acquired to the camera and use it. |
| SET | White balance data is acquired. |

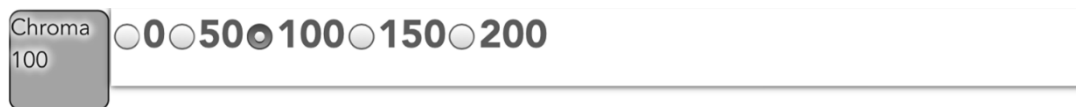
■ When acquiring white balance data manually

- "White" is displayed on the entire field angle to be recorded.
 - Adjust the subject so that white objects are displayed on the whole image in VIEW mode.
 - In extremely bright white or dark white, normal white balance can not be obtained. Adjust the aperture and light source so that the brightness is appropriate.

- 2 While reflecting the white object, select "SET" with WB.
 - White objects are taken and white balance data is calculated.
 - When calculation of white balance is completed, it is automatically set to "REG" and the taken white balance is set.
-

■ Chroma

Set chroma (saturation: vividness of color).



| | |
|-----|---------------------------|
| 0 | 0% saturation (B/W image) |
| 50 | 50% saturation |
| 100 | 100% saturation (normal) |
| 150 | 150% saturation |
| 200 | 200% saturation |

■ RGB-M

It is not used with MX-5



■ Save USB

Unsupported in MLink Ver.1.71a.

■ Seg

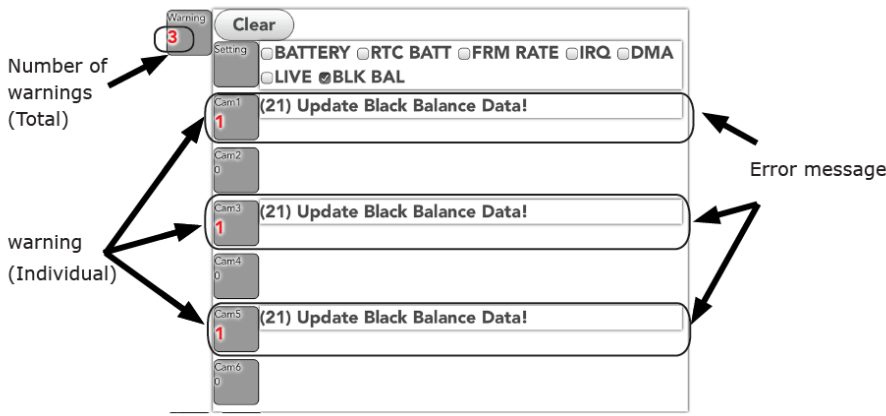
Unsupported in MLink Ver.1.71a.

■ Reset

Unsupported in MLink Ver.1.71a.

■ Warning

A message such as abnormality is displayed. Messages can also be hidden.





| | |
|---|--|
| Clear | Erase error messages one by one. |
| Setting: Items unchecked do not display error messages. | |
| BATTERY | Battery warning • This is a warning when the remaining capacity of the memory backup battery or the input power supply voltage drops or becomes abnormal. |
| RTC BATT | RTC battery warning • It is a warning when the voltage of the internal timer battery drops. |
| FRM RATE | Abnormal frame rate warning (FRM RATE) • Warning when the difference between the frame rate settings and the actual cycle is outside of the acceptable range. |
| IRQ | Camera display interrupt warning • Warning when the image display interrupt signal is lost. |
| DMA | Data transfer error • This is a warning if there is an error in the transfer related to the recorded images. |
| LIVE | Live transfer error • This is a warning when there is an abnormality in the transfer of live images not related to the recorded images. |
| BLK BAL | Mismatched black balance warning • Warning when the black balance settings don't match. |


• It is possible to hide it by removing the item of the error message which is displayed frequently.
However, there are important items such as black balance for recording, so please be careful with the setting.

■ Info

Information on connected MX-5, Camera head is displayed.

CID of Camera → 

Information of camera head → 


Information of DRP → 

| | | | | |
|----------|--|--|--|--|
| Type | MX-5 | | | |
| CID | 7707 | | | |
| IP Addr. | 172.21.128.184/255.255.0.0 | | | |
| Ver. | 1.30 | | | |
| HW Rev. | [1] 1:05-2:07-3:09-4:09-5:02-8:00-9:00 [2] 1:05-2:07-3:0b-4:09-5:01-8:00-9:00 [3] 1:05-2:07-3:0b-4:09-5:04-8:00-9:00 [4] 1:05-2:07-3:09-4:09-5:04-8:00-9:00 [5] 1:05-2:07-3:0b-4:09-5:02-8:00-9:00 [6] 1:05-2:07-3:09-4:09-5:01-8:00-9:00 [7] * [8] * | | | |

| | Cam1 | Cam2 | Cam3 | Cam4 |
|---------|---------|----------|---------|--------|
| Type | M-Cam | M-CamMFT | M2-Cam | M2-Cam |
| S/N | 13 | 20 | 5014 | 3 |
| Mem. | 4.0 GB | 8.3 GB | 4.0 GB | 4.0 GB |
| Batt. | MIDDLE | SMALL | LARGE | LARGE |
| Temp. | 59 C | 57 C | 73 C | 75 C |
| Live | * | * | * | * |
| Elapsed | 597h31m | 936h38m | 217h19m | 661h2m |
| Flash | 0% | 0% | 0% | 0% |
| Impact | 0 | 0 | 1 | 2 |
| | 0 | 19 | 1 | 0 |
| | 0 | 0 | 0 | 1 |
| | 0 | 0 | 0 | 0 |
| | 0 | 0 | 1 | 0 |
| | 0 | 0 | 0 | 0 |
| Heat | 0 | 0 | 1 | 0 |
| | 0 | 0 | 4 | 0 |

| | Cam5 | Cam6 | Cam7 | Cam8 |
|---------|--------|---------|------|------|
| Type | M-Cam | M-Cam | * | * |
| S/N | 16 | 10 | * | * |
| Mem. | 4.0 GB | 4.0 GB | * | * |
| Batt. | SMALL | SMALL | * | * |
| Temp. | 58 C | 56 C | * | * |
| Live | * | 8.4 fps | * | * |
| Elapsed | 231h3m | 625h58m | * | * |
| Flash | 0% | 0% | * | * |
| Impact | 0 | 0 | * | * |
| | 0 | 0 | * | * |
| | 0 | 0 | * | * |
| | 0 | 0 | * | * |
| | 0 | 0 | * | * |
| Heat | 0 | 0 | * | * |
| | 0 | 0 | * | * |

| | |
|-----------|--------------|
| Build | 191001101836 |
| MAC Addr. | 00044B66EFBF |
| DC-IN | 28 V |
| Temp. | 58 C |
| Elapsed | 385h7m |
| Lost | 0 |
| Heat | 4 |

Clock 19/07/04
19:57:30
 (OK)

■ About WebPanel

Display information of WebPanel. Screen customization is also possible.

About Web Panel





株式会社 ナックイメージテクノロジー

nac Image Technology Inc.

Language:

☒Auto
☐English
☐Japanese(日本語)
☐Chinese(中文)
☐German(Deutsch)

Go

Base:

Monitor

Settings

Playback

Control

Title:

nac WebPanel

Tips:

(Explanation to operators)

Item:

☐OFF
☒Cam/UI
☐UI/Cam
☐Slave

Tool:

☐OFF
☒ON
☒PLAY
☒VIEW
☒ARM
☒REC

Image:

☐OFF
☒ON

Menu:

☐OFF
☒ON
☒Scene
☒More
☒Live
☒Rotate
☒Comp
☐Meas
☒Speed
☒Size
☒Shutter
☒Lens
☒Black
☒Timing
☒Depth
☒L-Light
☒LUT
☒D-Gain
☒Gamma
☒Knee
☒MinMax
☒Enhance
☒WB
☒Chroma
☒RGB-M
☒Save
☒Format
☒Seg
☒Division
☒Flash
☐Sync
☒Reset
☐Network
☒Warning
☒Setting
☒Info
☒Camera
☒DRP
☒Voice
☒About
☒Config

Def:

☒Show Item
☒Show Tool
☐Show Menu
☒Single
☐2ch Horizontal
☐2ch Vertical
☐4ch Quad
☐4ch Horizontal
☐4ch Vertical
☐8ch Square
☐8ch Horizontal
☐8ch Vertical
☐18ch Vertical
☐24ch Vertical
☐Loop
☒NoSI
☒ExpOver
☐FocusMap1
☐FocusMap2
☐AOI(L/F)
☐LineProf
☐Histogram
☐Hist(RGB)
☐Average
☒NoGrid
☐1x1
☐2x2
☐3x3
☐4x4
☐5x5
☐6x6
☐7x7
☐8x8
☐9x9
☐10x10
☐16x16
☐20x20
☐25x25
☐30x30
☐32x32
☐NoOSD
☒AutoOSD
☐FullOSD
☐High-Spec
☐RT-Thumb
☐Guide
☐XY
☐MultiSeg

Lens:

▼Duplicate

☒AllLNC

(For importing lens settings)

Camera Parameters:

▼Duplicate

☐AllPRM

(For importing camera settings)

DRP:

(IP addresses separated by line breaks for controlling multi-DRP)

Go

Reset

Init

Customizing WebPanel

The screen can be customized (restricted, hidden).

The screen can be removed from functions which are not necessary for work and misoperation can be prevented.

In addition, explanations for work can be displayed on the tablet.

- **When using this function, the address (URL) of the browser becomes a long character string.**
(Example 1) Reflect the default (Without Title and Tips):
Approximately 800 characters
- **(Example 2) Reflect customization (Without Title and Tips):**
Approximately 1,000 characters
- **(Example 3) Using Base (with Title and Tips):**
Approximately 1,500 characters
- **(Example 4) Use M-CamMFT lens reproduction data for 4 units (without Title and Tips):**
Approximately 4,000 characters
- **When using Microsoft Edge, using a long address (about 2,000 characters or more) may break character strings and may not be able to use this function normally.**
- **If the browser is reloaded (reloaded) while customization is in progress, the setting contents will be lost. It is recommended to reflect the customization content frequently**

■ Customization management procedure (For administrators)

1. Start WebPanel.
2. Tap "About WebPanel" → "Config" to display the customize screen.
3. From "Base", tap the one closer to the task purpose and select it.
4. Enter a summary of the work purpose in "Title". This item is used as the name of the home screen or bookmark icon.
5. Enter a work tip in "Tips". This item is displayed at the bottom of the parameter setting menu area.
6. Adjust the details as necessary. ("Item" "Tool" "Image" "Menu" "Def" "Lens" input)
7. Tap "Go". The customization content is reflected.
8. Make sure that the customized screen matches the task purpose. If further adjustment is required, repeat the previous steps.
9. Register customized screens on bookmarks and home screens.

■ Reproduction procedure (For workers)

From the bookmark or home screen, tap the registered icon.

■ Item (Outline)

Language: The display language of WebPanel can be selected.

| | |
|------------------|---|
| Auto | Display language automatically from the language setting of the terminal used (default setting) |
| English | Set the display language to English. |
| Japanese (日本語) | Set the display language to Japanese. |
| Chinese (中文) | Set the display language to Chinese. |
| German (Deutsch) | Set the display language to German. |

Base: Selectable template for simple setting. Customization is also possible based on this template.

| | |
|----------|---|
| Monitor | Make it the screen for handling as a viewfinder. Operate the camera remotely from another tablet or MLink etc. However, the live setting (Layout, Image analysis setting, Grid setting, OSD) on the WebPanel proprietary function can not be operated remotely. |
| Settings | The screen for adjusting the image quality at VIEW will be displayed. |
| Playback | Make it the screen to confirm the recorded image |
| Control | Make the screen for only camera operation. Images are viewed with another tablet or MLink etc. |

Title : Work title. The entered name is displayed as the name of the home screen or bookmark icon.

Tips : Work tip. The entered sentence is displayed at the bottom of the menu button group.

Item : Settings group related to display of item list area

| | |
|--------|---|
| OFF | Exclude item list area. |
| Cam/UI | Use the item list area. (Left side: camera item, right side: layout selection) |
| UI/Cam | Use the item list area. (Left side: layout selection, right side: camera item) |
| Slave | It is linked with another tablet or operation from MLink. |

Tool : Settings related to the display of the main tool.

| | |
|-----|--|
| OFF | Exclude the main tool. Switch the camera with the screen tap. |
| ON | Use the main tool. |

| | | |
|------|---|--|
| PLAY | Use the playback related buttons. | |
| | Mode switching STOP↔PLAY | |
| | Display | Display frame number |
| | Setting button | To the set start frame To the set end frame Return (1 second of playback) Go forward (for 1 second of playback) |
| VIEW | Use VIEW related buttons | |
| | Mode switching STOP ↔ VIEW | |
| | Setting button | Low light button Autofocus button (Unsupported in Ver.1.71a) |
| ARM | Use buttons related to recording start. | |
| | Mode switching | STOP → VIEW → ARM |
| REC | Use buttons related to recording end. | |
| | Mode switching | ARM → REC └→ STOP |

① Camera switching at VIEW / ARM is always possible

Image : Setting group related to image display area.

| | |
|---------------------|--|
| OFF | Exclude image display area. Live images of the camera are not displayed at all. |
| ON | Use the image display area. |
| "Scene" to "Voice" | Use only the selected item. To use nested menus, please also select their parent items. |
| "About" to "Config" | When unchecking, screen customization after this is prohibited. |

Def : Initial value at the start of WebPanel.

| | |
|------------------------|--|
| Show Item | Make the item list displayed on the screen. |
| Show Tool | Make the main tool displayed on the screen. |
| Show Menu | Make the menu display in the image area. |
| "Single" to "RT-Thumb" | Treats the selected value as an initial value. |

Lens : Setting Groups for Micro Four Thirds Lens. (Unsupported in MLink Ver.1.71a)

Camera Parameters : A group of settings related to recording parameter reproduction.

| | |
|-----------|---|
| Duplicate | Copy the current recording settings to this customization. |
| Data area | This data is treated as the initial value of the parameter. |

DRP : Setting group for multiple MX-5 simultaneous control (Unsupported in MLink Ver.1.71a)

Go : Reflect the contents of customization. Tap to update the browser screen and address.

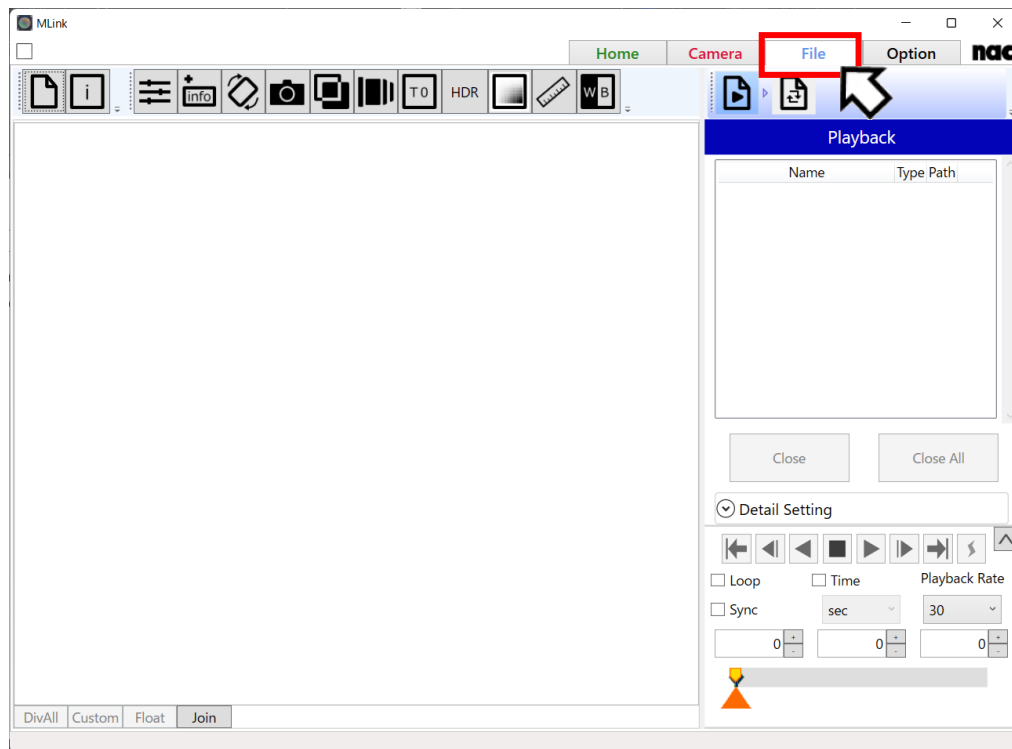
Reset : Redo the setting. Tap to return to the previous selection.

Init : Reflect the standard setting. Tap to return the browser screen and address to standard.

4.3 File Operation

File operation takes place under the file tab.

If "File" is selected from the mode tab, the following screens appear.



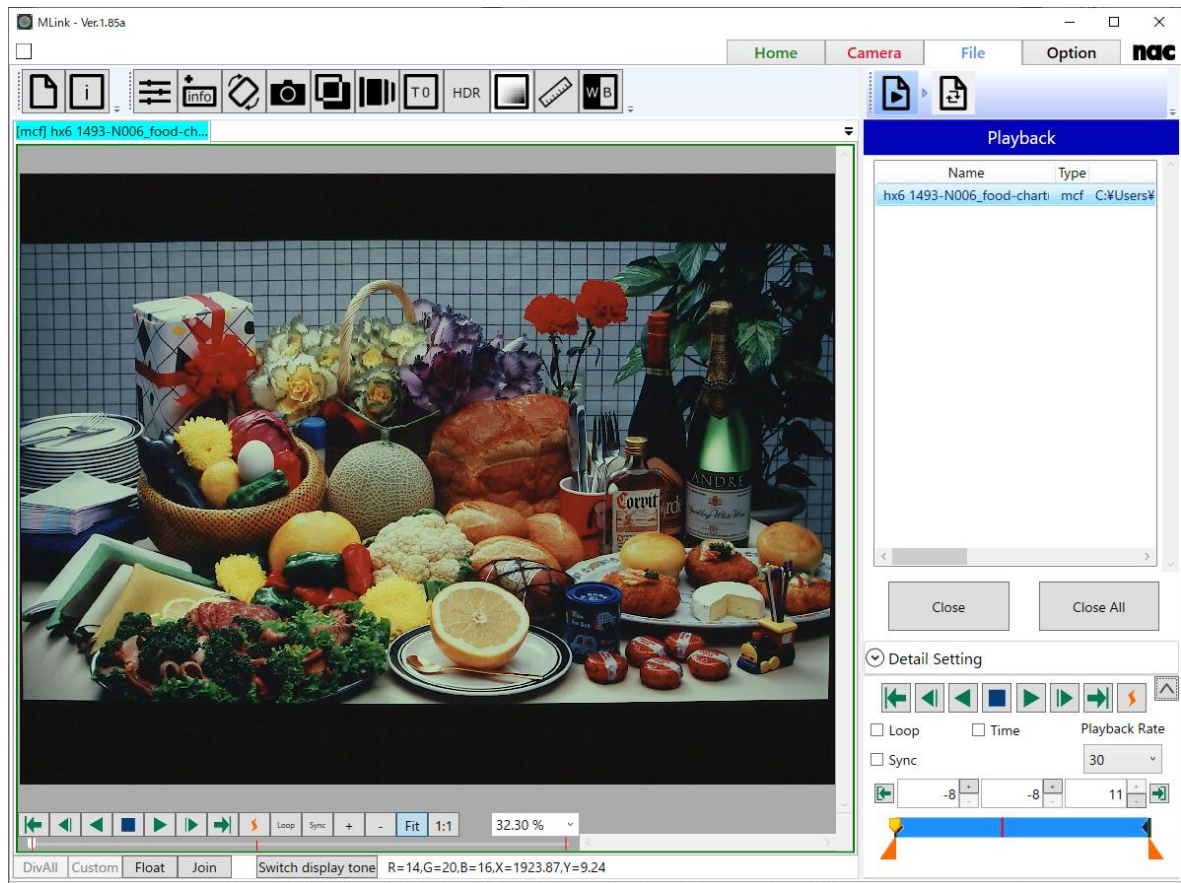
Each task on the file task tool bar is performed as follows.

- **4.3.1 File Playback** (refer to ⇒p.236)
Open the file and check the images.
- **4.3.2 Format Conversion** (refer to ⇒p.241)
Set the conversion range and perform format conversion.

4.3.1 File Playback

If "Play" is selected from the file task tool bar, the file playback screen appears.

Open or close the file to be played back on the file playback screen.

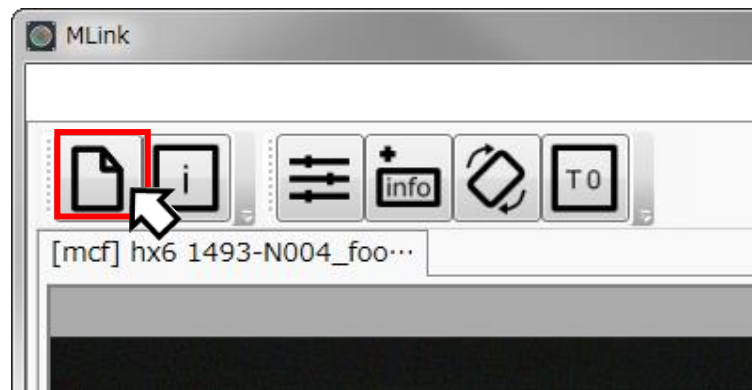


File playback screen

Open the Image File

To open the image file, click "Open" on the quick tool bar and select the image file from the image selection screen.

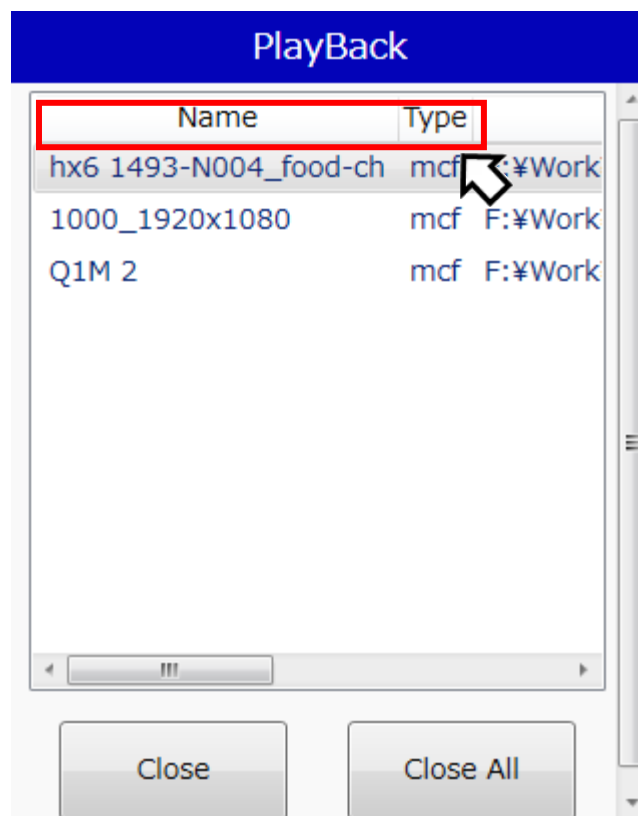
Select the image file with the corresponding file format. For more information, **refer to p.333**.



Sort the Files

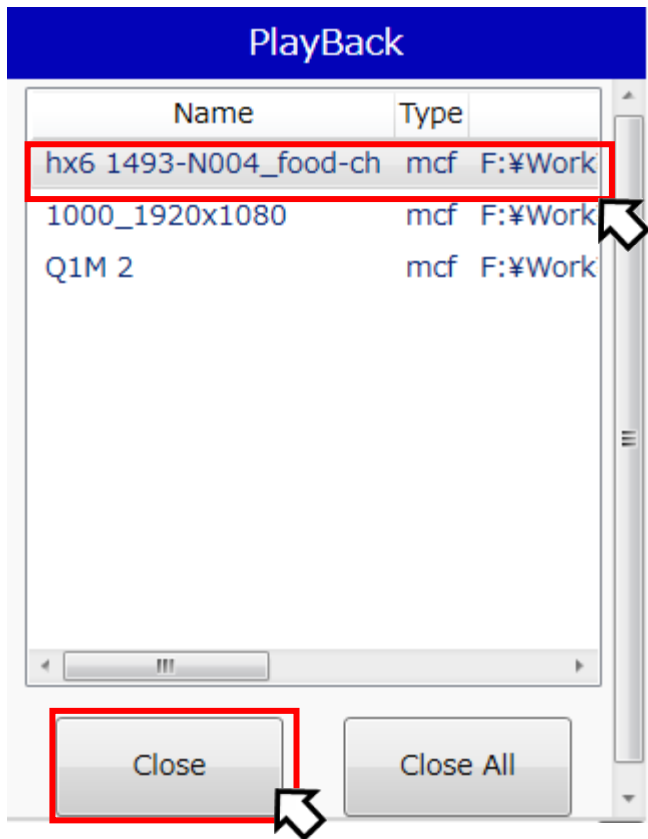
To sort the opened image files in a batch, click on the header of the list.

Click "Name" to sort in ascending order by file name, and "Type" to sort in ascending order by file extension. Click again to sort in descending order.



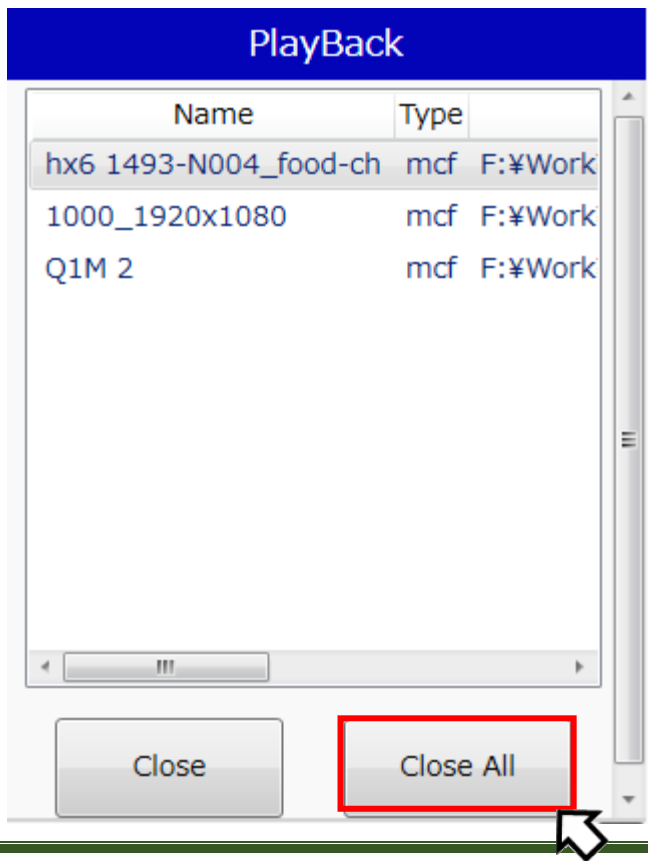
Close the File

To close the opened image file, select the file to be closed from the list and click "Close".



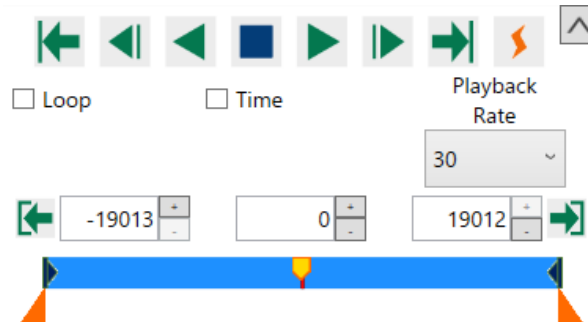
Close All

Click "Close All" to close all of the image files shown on the list.













Play Files

Play and review files and select the playback range from the control panel at the bottom of the screen.

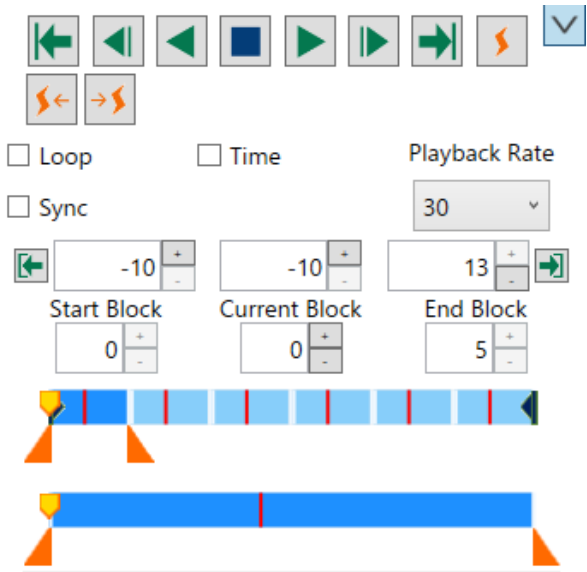


Description of each button is as follows.

| Button | Name | Description |
|---|------------------------|--|
|  | To start frame | Move the current frame to the start frame. |
|  | Back 1 frame | Back 1 frame. Only available during stop. |
|  | Decrease playback rate | Slow down the playback rate. Only available during playing back. |
|  | Play | Start playback. |
|  | Reverse play | Start reverse playback. |
|  | Stop | Stop playback. |
|  | Forward 1 frame | Forward 1 frame. Only available during stop. |
|  | Increase playback rate | Speed up the playback rate. Only available during playing back. |
|  | To end frame | Move the current frame to the end frame |
|  | Trigger jump | Jump to the trigger frame or event frame. |

| | | |
|--|-----------------|--|
| <input type="checkbox"/> Loop | Loop play | If checked, playback loops within the playback range. |
| <input type="checkbox"/> Sync | Sync | Displays synchronously of multiple files with relative time is aligned. |
| <input checked="" type="checkbox"/> Time <div>sec</div> | Time display | If checked, the playback range is displayed in time instead of frames. The pull-down menu allows switching the unit of time. |
| | Set start frame | Sets the current frame as the starting frame. |
| | Set end frame | Sets the current frame as the ending frame. |

The button is an extension button. Clicking this turns ON/OFF the display of the block range, current block and slider.

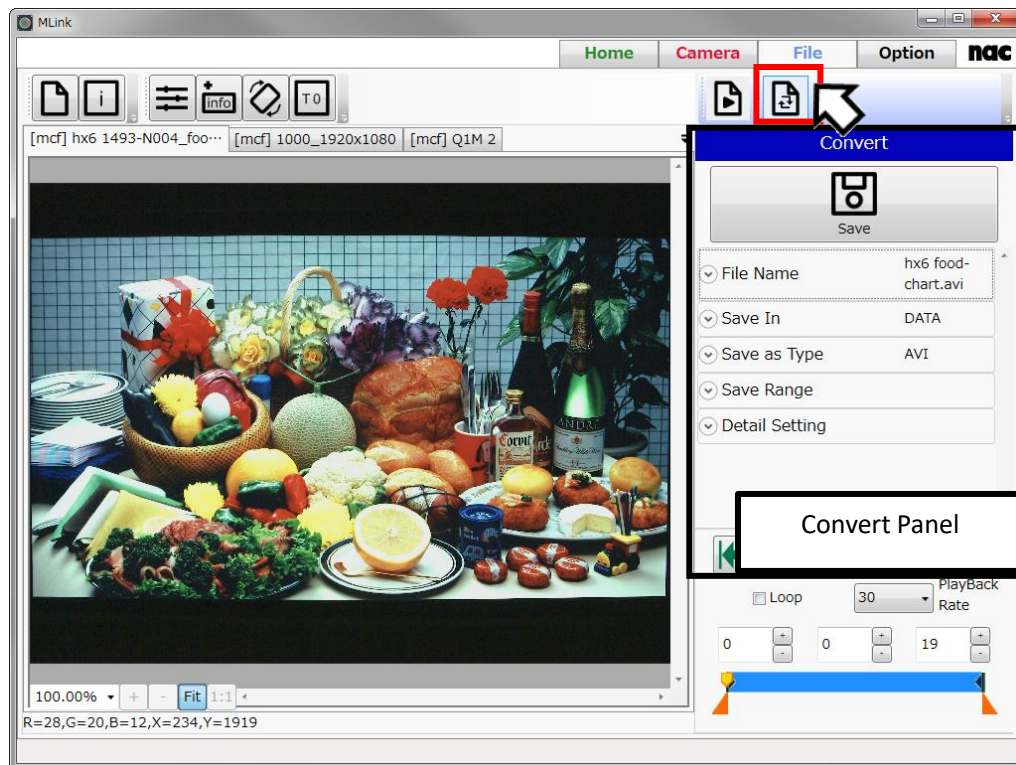


The operation of additional buttons is as follows.

| Button | Name | Operation |
|--------|-------------------|--|
| | To previous event | Move from the current frame to the previous event. |
| | To next event | Move from the current frame to the next event. |

4.3.2 Format Conversion

Select "Convert" from the file task tool bar and the format conversion screen appears.
Convert from the camera images to each type of format on the format conversion screen.

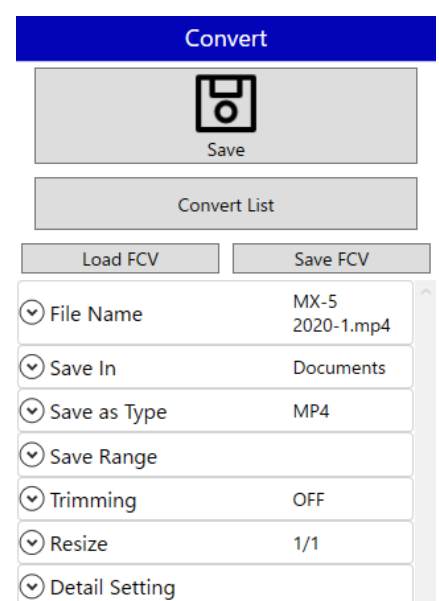


"Format Conversion" Screen

Conversion Settings Panel

Use the conversion settings panel to set the file name, save folder and save format when converting the format to convert the format of the image file and save to a PC. The items that can be set are as follows.

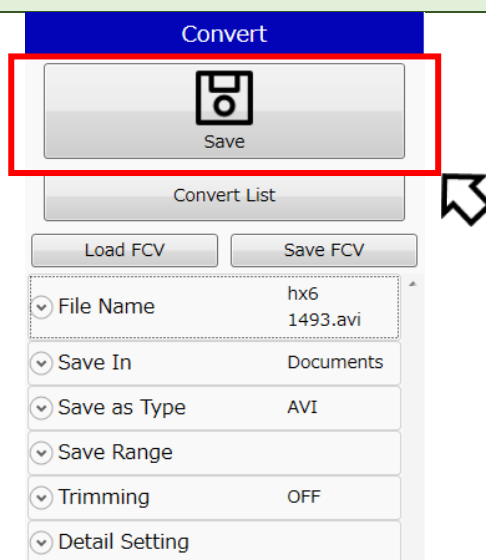
- File name
- Save in
- Save as type
- Save range
- Trimming
- Resize
- Detailed setting



Convert the Format

After setting the save file name, save destination and save format, click “Save” to convert the format.

The camera can be used during format conversion. There is no need to have the MLink be on standby until the conversion is complete.



Format conversion is only possible on MCFF files.

Save formats that can be set with format conversion include the following.

| File Format | Extension | File Type |
|---------------------------|-----------|--------------------|
| MCF | .mcf | MCFF |
| AVI | .avi | Color 24bit AVI |
| AVI (Monochrome 8bit) | .avi | B/W 8bit AVI |
| AVI (H264) | .avi | H.264 AVI |
| MP4 | .mp4 | Color 8bit MP4 |
| TIFF (Monochrome 8bit) | .tif | B/W 8bit TIFF |
| TIFF (24bit) | .tif | Color 24bit TIFF |
| Bitmap (Monochrome 8bit) | .bmp | B/W 8bit bitmap |
| Bitmap (24bit) | .bmp | Color 24bit bitmap |
| JPEG | .jpg | Color 24bit JPEG |
| TIFF48 (48bit) | .tif | Color 48bit TIFF |
| TIFF16 (Monochrome 16bit) | .tif | B/W 16bit TIFF |
| TIFF16 (RAW) | .tif | B/W 16bit TIFF |

- To get the original luminance (without dynamic range compression) from MCFF recorded with DRES mode, set the luminance characteristic to LINEAR, select TIFF16 (Monochrome 16bit) or TIFF48 (color 48bit) as the save format, and then convert.
- When converting with the save format of TIFF16 (RAW), settings of image quality adjustment will not be applied to the output data.
- When converting with the save format of TIFF16(Monochrome 16bit) or TIFF48(color 48bit), the black level of the image is:
 - 192 if the pixel bit depth of the image is 12 bits and the LUT is set to LINEAR
 - 128 otherwise
- If you select MCF as the save format and then convert, you can cut out frames from MCFF data. The range of cut out is followed to the save range. Settings for the image quality adjustment and the image cropping are not reflected.
- If you select AVI as the save format, you can specify compression program, compression quality, and frame rate.
- When converting with the save format of AVI(H264), you can specify frame rate, profile, and bitrate. The bitrate will be disabled if **Variable bitrate** is checked.
When variable bitrate is used, CRF(Constant Rate Factor) encode option of H.264 is used to maintain a consistent quality through the video.
By specifying profile, functions are defined from encode technologies of H.264 according to the purpose. Main, the default setting, is recommended to be specified.
- When converting with the save format of MP4, you can specify quality and frame rate. You can specify the quality from 1 to 51. The smaller the value, the higher the quality.

**MLink cannot open TIFF16 (Monochrome 16bit) and TIFF48 (color 48bit) files.
Please use other software such as Adobe Photoshop.**

Conversion Range Settings

Set the block and frame range for format conversion.

⬆ Save Range

| Block | Start | End |
|----------------|--------------------------------------|--------------------------------------|
| Recorded Range | 0 | 3 |
| Save Range | <div>0<div>+</div><div>-</div></div> | <div>0<div>+</div><div>-</div></div> |

| Frame | Start | End |
|----------------|--|---------------------------------------|
| Recorded Range | -25 | 24 |
| Save Range | <div>-25<div>+</div><div>-</div></div> | <div>24<div>+</div><div>-</div></div> |

If setting the conversion range in a range that is the same as the playback range, turn this setting ON in “Make the Conversion Range the Same as the Playback Range” in Detailed Settings.

If ON, the conversion range is changed to the same range as the playback range simultaneously with the change in the playback range from the control panel.

If OFF, the conversion range does not change even if the playback range is changed. Set the conversion range from “Conversion Range” on the conversion settings panel. This is a useful function when always converting the same range.

Trimming

Any range of the image is trimmed, and the format can be converted with the image reduced.

⤴ Trimming ON

OFF ON

Centering

Start point X Y

0 0

Size

Width Height

1920 1080

When trimming is turned on, a red frame representing the trimming range is displayed on the image. The range can be set by the drag operation on the image. It is also possible to set the start position / size of the range to be trimmed by numeric input. When trimming is turned off, the trimming setting is invalidated and the format is converted as it is with the original image.

| Set Value | Description |
|-------------|--|
| Centering | Selecting this button moves the center of the trimming area to the center of the image. |
| Start point | Specify the coordinates of the upper left corner of the trimming area by value. The origin of the coordinates is the upper left corner of the image. |
| Size | Specify the trimming size by value or select from preset values. |

If the trimming area goes outside of the image, a margin will be added.



Resize

You can enlarge or reduce the image size in format conversion.

⤴

Resize

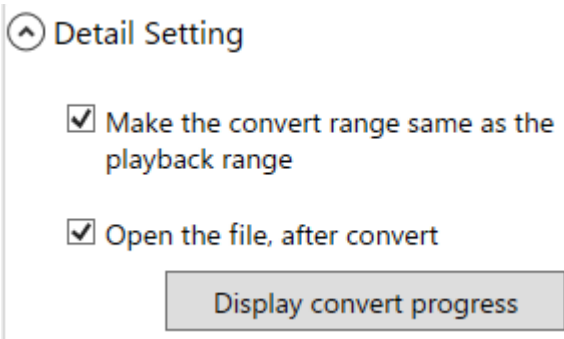
1/1

| | | |
|-------------------|------------------|----------------|
| | 1/1 | 1/2 |
| Resize | High-res. 2X | High-res. 4X |
| | Fix aspect ratio | |
| Size after resize | Width 1280 | Height 1024 |

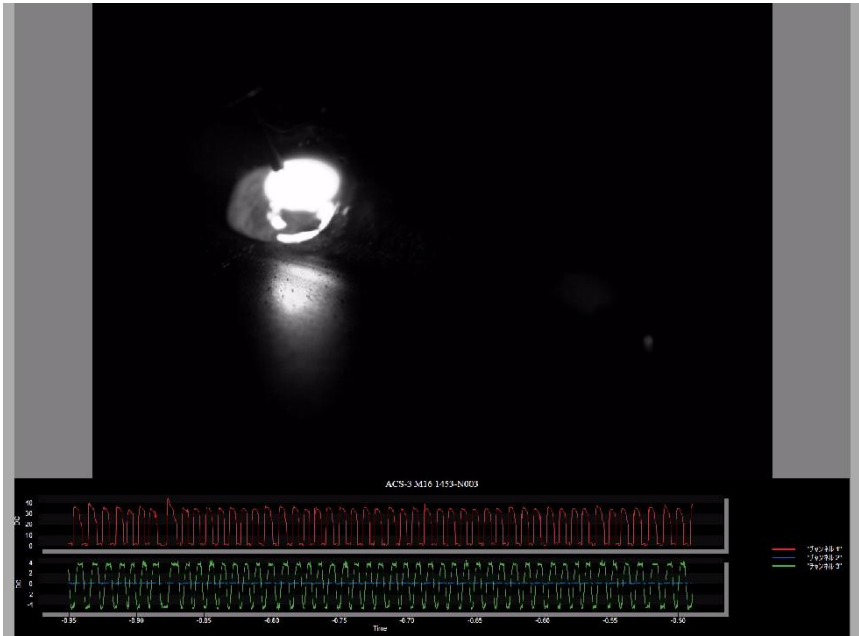
| Set Value | Description |
|-------------------|--|
| Resize | <p>Specifies the resize method.</p> <p>1/2: Reduces the image by half.</p> <p>High-res.2X: Magnifies the image 2 times preserving the details.</p> <p>High-res. 4X: Magnifies the image 4 times preserving the details.</p> <p>Fix aspect ratio: resizes the image to the specified width or height while keeping the aspect ratio.</p> <p>1/1: No resizing.</p> |
| Size after resize | <p>Shows the width and height of the image after format conversion.</p> <p>If "Fix aspect ratio" is selected, you can enter the value directly.</p> |

Detail Settings

Detail setting of format conversion.



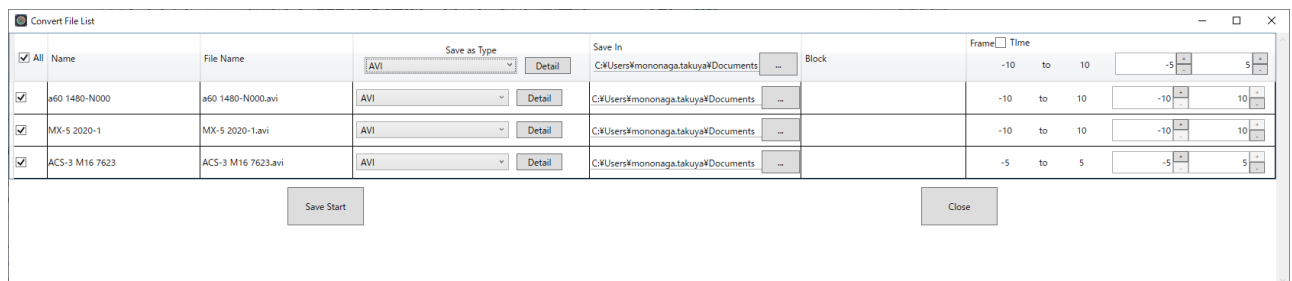
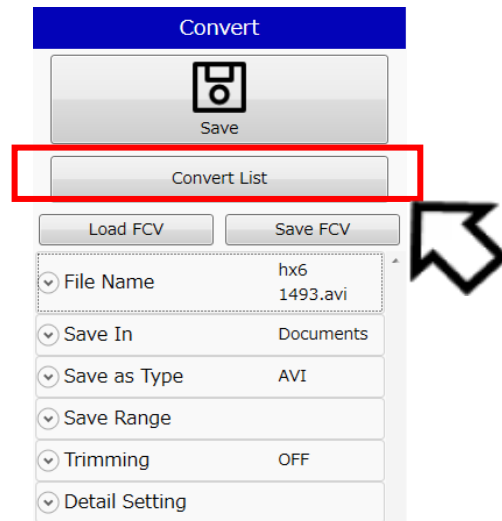
| item | expression |
|---|--|
| Make the convert range same as the playback range | If checked, the convert range is equal to the play range simultaneously when you change the play range from the control panel. |
| Open the file, after convert | If checked, the file is opened automatically after conversion. |
| Display convert progress | Shows the progress bar of conversion. |



Example of the converted image with the waveform graph added.

Batch Conversion

By clicking the "conversion list" button on the conversion setting panel, the "Convert File List" window will be displayed and you can format convert multiple MCFF files at once.



For each line, you can set the format conversion of the selected MCFF file. When set with the top title line, parameters for format conversion are set in all of the MCFF files.

If the "Time" checkbox is checked, the range is displayed in time instead of frames.

The following items can be set in the "Convert File List" window.

☒ All The checked MCFF file is subject to format conversion. If format conversion is not done, remove the check mark.

Name The file name of the MCFF file that is the base of the format conversion is displayed.

File Name Specify the type of file after format conversion.

Save as Type Format Specify the file name to be attached to the data to be

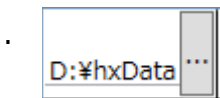
converted.

Save In

The folder of the save destination outputted after format conversion is displayed. When "Default format conversion output folder" is set in the "prescribed folder" of the option setting, the folder path of the conversion output destination set there is displayed. (Refer to p.278)

To change the save folder, do the following operations.

- 1 Click the "..." button of the save destination.



- 2 The "Browse for Folder" window appears, so select the download destination folder and press the "Select Folder" button.

Block

If the MCFF file before conversion is a multi-trigger file and the MCFF file contains multiple blocks, you can specify the start and end blocks of the block range.

It can be set in 1 block unit.

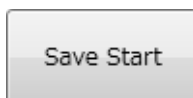
Frame

Specify the start frame and end frame of the conversion range.

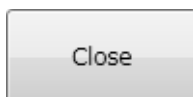
It can be set in 1 frame unit.

When recording with multi trigger, set the same save start frame and end save frame for all blocks.

For each button on the "Convert File List" window, do the following operations.



Convert the format of the MCFF file with a check mark in the check box.

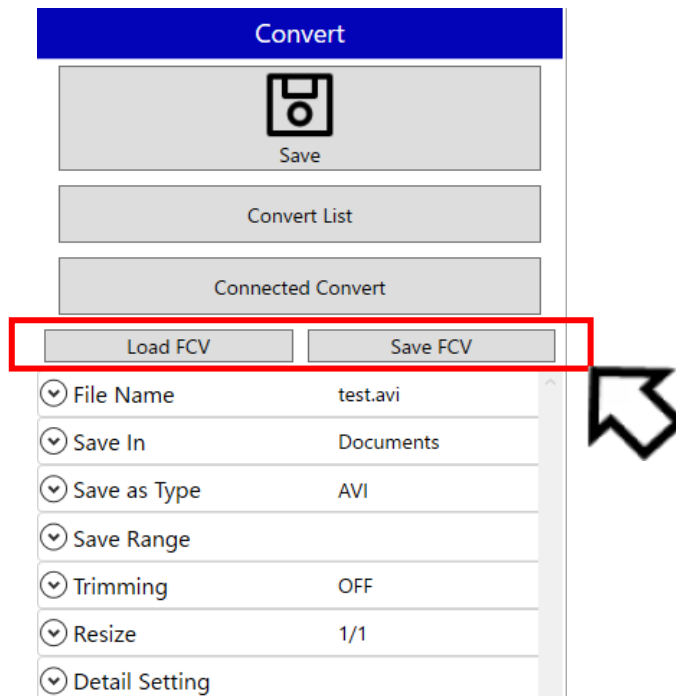


Close the "Convert File List" window.

Load Conversion Setting / Save Conversion Setting

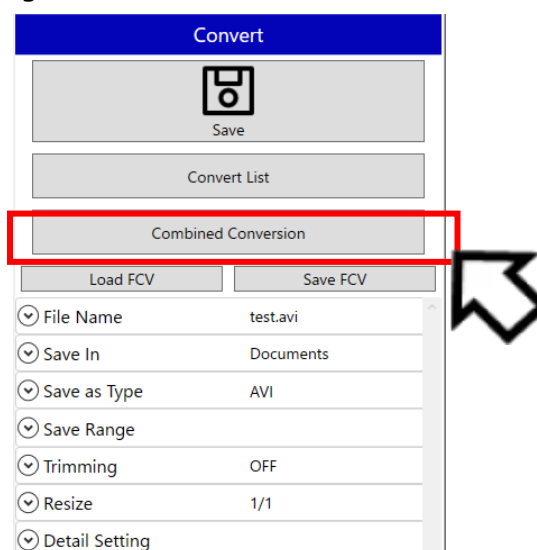
To load the conversion settings, select the **Load FCV** button. To save the conversion settings,

select the **Save FCV** button.



Combined Conversion

By selecting the **Combined Conversion** button in Convert Setting Panel, the Combined Conversion preview window will be displayed. With Combined Conversion, you can combine multiple movie files into a single movie.



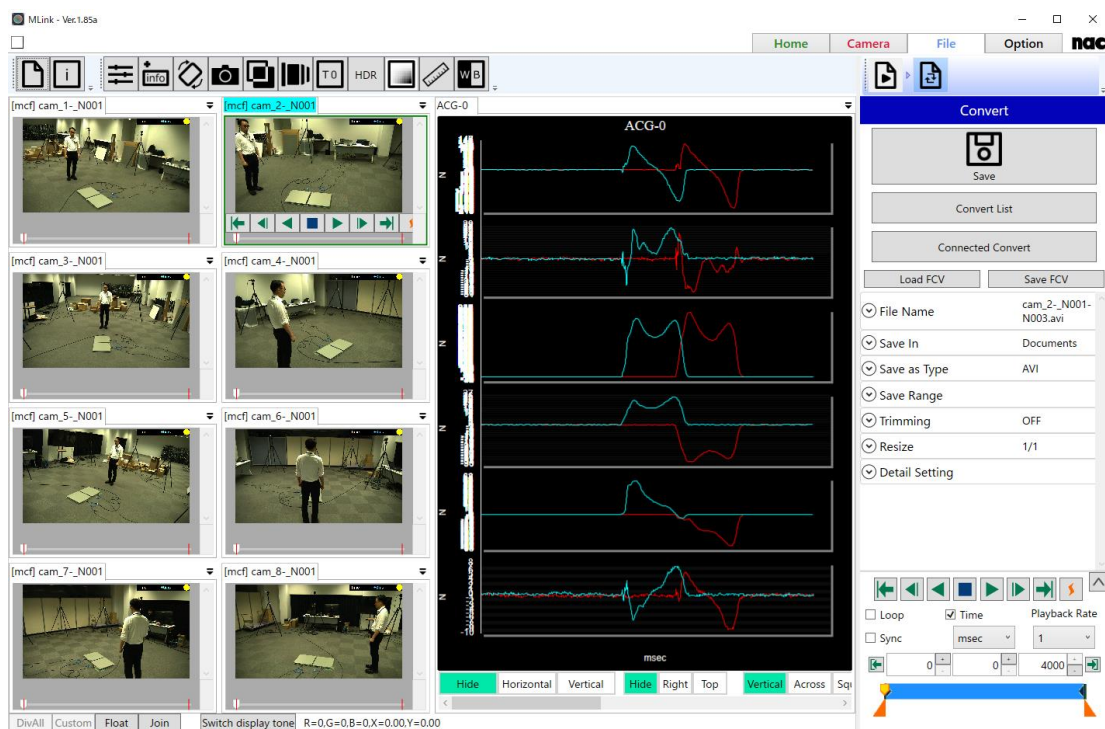
When the Combined Conversion preview window appears, movies are arranged according to the layout of the image display area at the timing of opening the window. In this window, you can adjust the position and size of movies and waveform items, trim movies, and set conversion

settings such as output file format and conversion range.

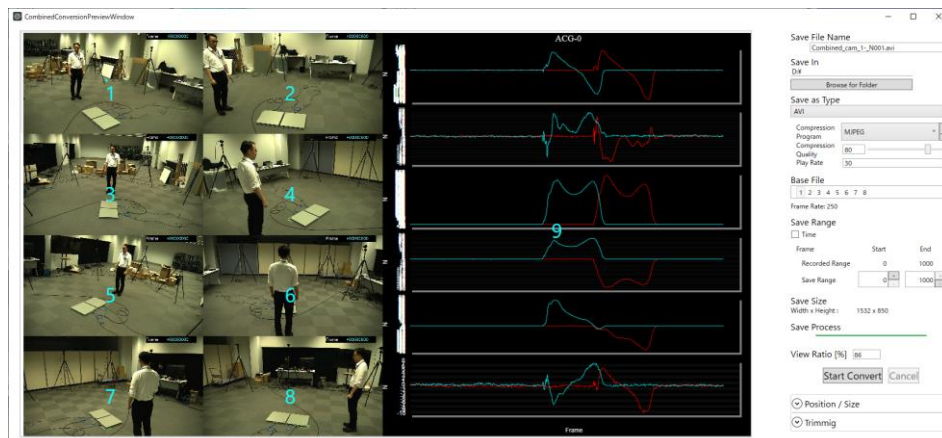
To arrange the layout of the image display area, use **Custom Split**. If you change the layout with other ways, such as drag and drop, the preview may not work as expected. For more information, refer to **p.299**.

An example of an operation from opening file to executing Combined Conversion is as follows.

1. Open the target file of combined conversion.
2. Click on **Custom Split** button in status bar to adjust the layout.
3. Set image correction, superimposition, and rotation / flip for each movie as needed.
4. Click on the **Combined Conversion** button in Convert Setting Panel to display combined conversion preview window. The preview is displayed according to the layout specified in step 2.



▲The layout specified by Custom Split



▲Combined Conversion preview window displayed according to the layout specified by Custom Split

5. Set conversion settings such as the format type and the conversion range.
6. Click on **Start Convert** button to start Combined Conversion. According to the setting of the Combined Conversion preview window, multiple movies are converted as a single movie.

Conversion Setting

- **Save File Name**
Enter the name of the output file.
- **Save In**
Specify the output directory.
- **Save as Type**
Select the format of the output file.
- **Base File**
Specify the file basis for the conversion range.
When converting by combining files with different recorded frame rates, the conversion range of files other than base file follows the recorded frame rate and the conversion range of the base file.
- **Save Range**
Enter the conversion range of the output file. You can specify it with relative time or frame.
- **Save Size**
Displays the width and the height of the output file.
The values are reflected after the size adjustment described below is applied.
- **Save Process**
Displays progress of the conversion.
- **View Ratio**
Enter the view ratio of the preview.
The preview is displayed with size this ratio applied to the save size.
You can also change the view ratio by manipulating mouse wheel in the area of the preview.

Save File Name
Combined_cam_1-_N001.avi

Save In
D:¥
Browse for Folder

Save as Type
AVI

Compression Program
MJPEG

Compression Quality
80

Play Rate
30

Base File
1 2 3 4 5 6 7 8

Frame Rate: 250

Save Range
☐ Time

| Frame | Start | End |
|----------------|-------|------|
| Recorded Range | 0 | 1000 |
| Save Range | 0 | 1000 |

Save Size
Width x Height : 1532 x 850

Save Process

View Ratio [%] 86

Start Convert Cancel

Position / Size

Trimmig

Start Convert / Cancel

Executes Combined Conversion and stop.



- Start Convert
Starts Combined Conversion.
- Cancel
Stops Combined Conversion.

Position / Size

Adjusts position and size for items that are to be combined.

- Target Items
Specify item(s) to adjust position and size.
The number of the item corresponds to that shown in blue letters in the center of the preview image. You can also specify the target item by clicking on the preview image. You can also have multiple specifications by clicking on the number while holding down Ctrl key.
If the item is selected, a blue circle will appear in the center of the preview image for that item.
 - First Selected Item No
Displays the number of the first selected item in case multiple target items are selected. Adjustments of position and size are made based on the top left of this item.
- PosX
Displays the x-coordinate of the top left of the first selected item. You can move the selected item horizontally by entering a value.
- PosY
Displays the y-coordinate of the top left of the first selected item. You can move the selected item vertically by entering a value.
- Zoom Ratio
Displays the ratio to the original size of the first selected item. You can change the ratio of the selected item by entering a value.

 A screenshot of the "Position / Size" dialog box. It has a title bar with a maximize button and the text "Position / Size". Inside, there is a "Target Items" section with a list of numbers 1 through 9, where the number 1 is highlighted in blue. Below this is a label "First Selected Item No:" followed by the value "1". There are three input fields with spinners: "PosX" with value "0.00", "PosY" with value "0.00", and "Zoom Ratio [%]" with value "13.96". Below these are two more input fields with spinners: "Width" with value "986.56" and "Height" with value "603.00". At the bottom of the dialog is a button labeled "Replace Item".

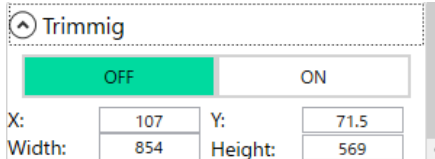
- Width
Displays the overall width of the selected item.
You can change the width of the selected item by selecting a preset value from the pull-down menu or entering a value.
- Height
Displays the overall height of the selected item.
You can change the height of the selected item by selecting a preset value from the pull-down menu or entering a value.
- Replace Item
Replaces the position of two selected items.

Trimming

Trims the connected image.

When this function is ON, the trimming frame is displayed. The inside of the trimming frame is subject to the conversion target.

- X
Enter the x-coordinate of the top left of the trimming frame.
- Y
Enter the y-coordinate of the top left of the trimming frame.
- Width
Enter the width of the trimming frame.
- Height
Enter the height of the trimming frame.



| Trimming | | | |
|--|-----|---------|------|
| <div><div>OFF</div><div>ON</div></div> | | | |
| X: | 107 | Y: | 71.5 |
| Width: | 854 | Height: | 569 |

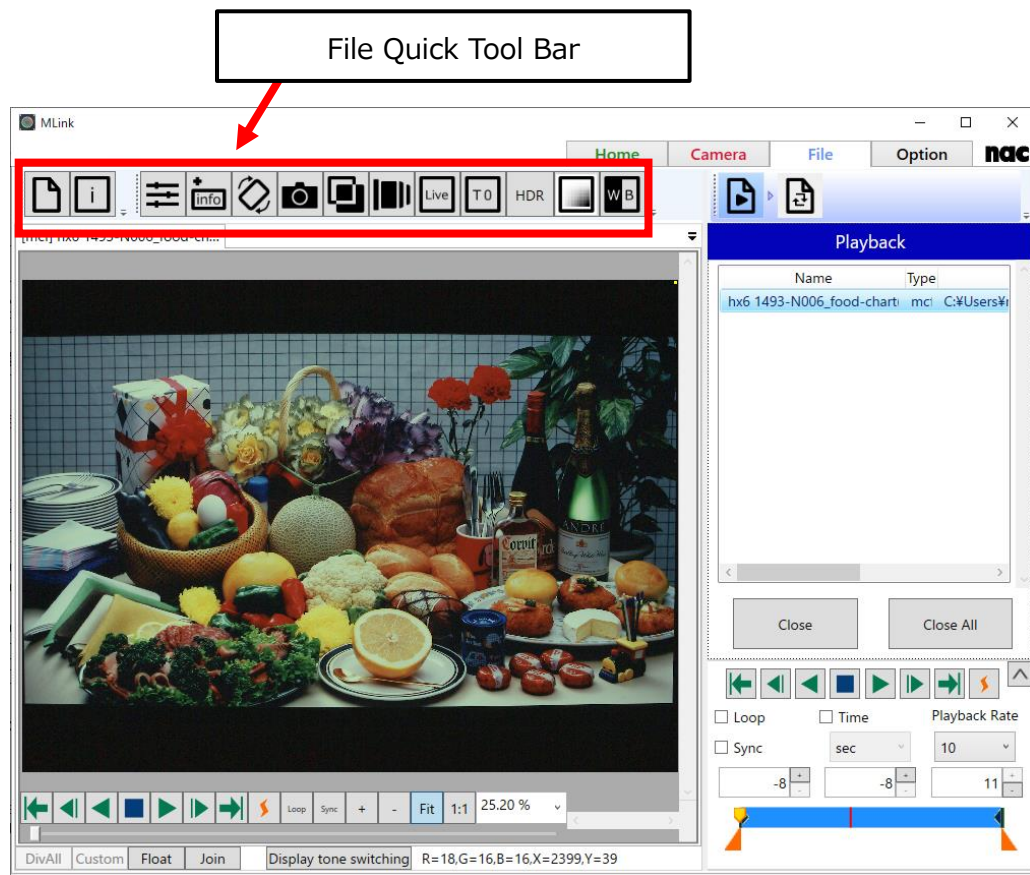
Specification of Conversion

Specification of combined conversion is as follows.

- Supports AVI, MCFF, NWF as input file type.
- Supports AVI and MP4 as output file type.
 - Supports MJPEG, Uncompressed, Intel IYUV codec, Microsoft Video 1, x264vfw - H.264/MPEG-4 AVC codec as output codec of AVI file.

- Converts according to the layout of the preview window.
 - If the trimming setting is ON, only the inside of the trimming frame will be converted.
- Image Correction done before showing the preview window applies to the preview of the combined conversion and the processing of the combined conversion.
- Superimposition done before showing the preview window applies to the preview of the combined conversion and the processing of the combined conversion.
- Rotation, Flip, Trimming done before showing the preview window applies to the preview of the combined conversion and the processing of the combined conversion.
- Simple measurement done before showing the preview window applies to the processing of the combined conversion. It does not apply to the preview of the combined conversion.
- The width of the output image is adjusted to a multiple of 4 and the height to a multiple of 2.

4.3.3 Settings that can be Set from the Quick Tool Bar in the File



The following settings can be made from the file quick tool bar.

- Open the Image File
- Show Properties
- Image Quality Adjustment
- Superimpose
- Image Rotation and Inversion
- Snapshot
- Image Overlay
- Lens Control
- T=0 Correction

- **Custom White Balance**
- **HDR Settings**
- **Exposure Setting**
- **Simple** measurement

Open the Image File



Select an image file from the image selection screen.

Show Properties



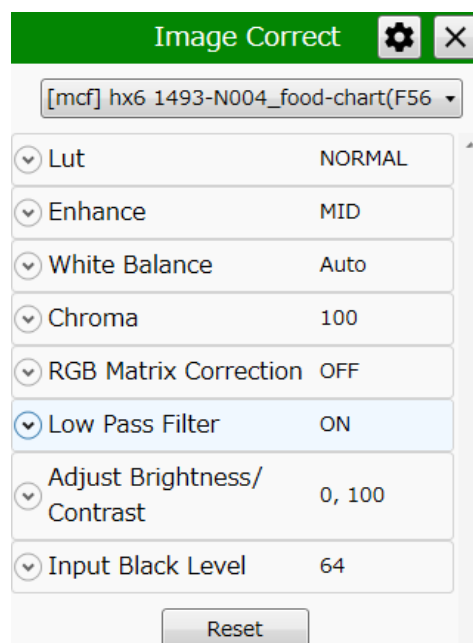
Displays the property information of the MCFF file.

Image Quality Adjustment



Open the image quality adjustment setting panel of the MCFF file.

The same item as the image quality adjustment panel called from the camera quick tool bar is also displayed. (refer to ⇒p.128)



Items that can be set are as follows.

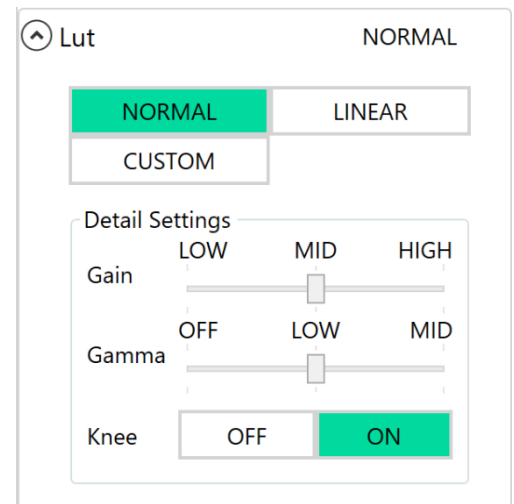
- **Luminance**
- **Enhance**
- **White Balance**
- **Chroma**
- **RGB Matrix**
- **Low Pass Filter**
- **Adjust Brightness/Contrast**
- **Input Black Level**

Luminance

Set the input/output transfer characteristics when the image data appears.

Normal

With the normal setting, display the image with the input/output transfer characteristics coordinated with the dynamic range of the camera. Gain • gamma • knee can be used.



Gain

Set the brightness.

| Set Value | Description |
|-----------|-------------------------------------|
| LOW | Lowers the gain by one aperture. |
| NORMAL | Standard brightness. |
| HIGH | Increases the gain by one aperture. |

Gamma

Set the gamma correction.

| Set Value | Description |
|-----------|--------------------------|
| OFF | No gamma correction. |
| LOW | Low gamma correction. |
| NORMAL | Normal gamma correction. |

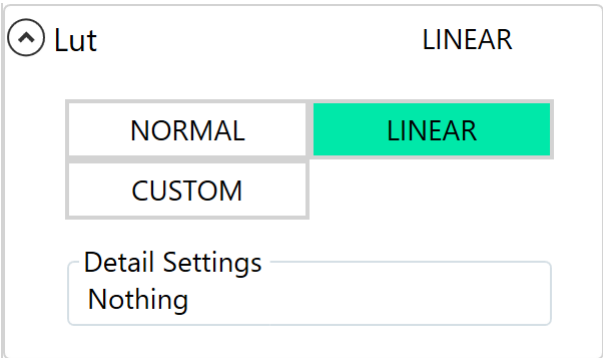
Knee

Setting where the gain is lowered relative to the signals exceeding the regulated luminance level, with or without correction to expand the dynamic range.

| Set Value | Description |
|-----------|----------------|
| ON | Knee enabled. |
| OFF | Knee disabled. |

Linear

Gain · gamma · knee settings are ignored and the data is converted to linear for display.



CUSTOM

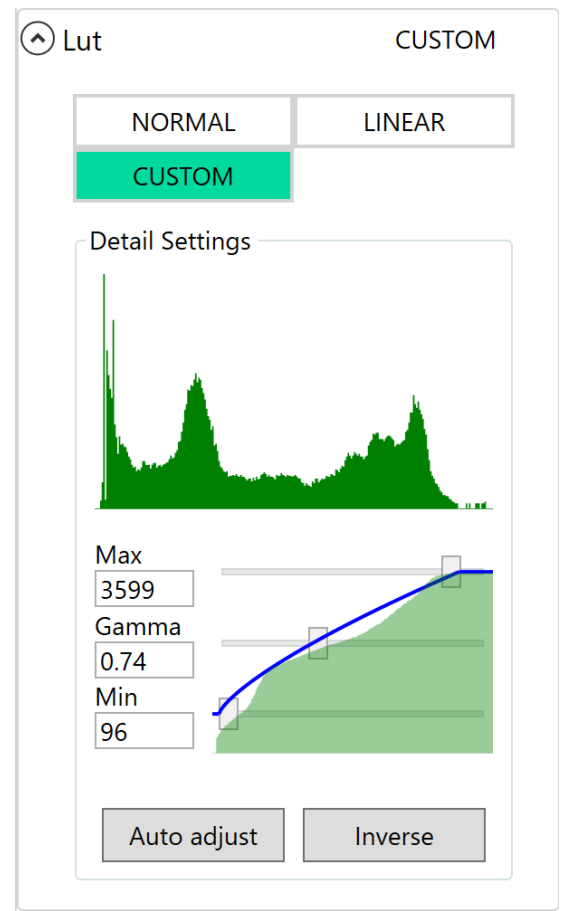
The camera data is displayed with the specified input / output conversion characteristics.

By specifying minimum luminance input value, maximum luminance input value, gamma value, even data with low luminance difference can be emphasized and displayed.

When selected, the histogram is displayed in the upper row of the detailed setting, and the cumulative frequency graph obtained by integrating the histogram in the lower row is displayed with a green fill.

The setting value graph is indicated by a blue line and means the output pixel value (vertical axis) with respect to the input pixel value (horizontal axis). This setting value graph is determined by Max (maximum brightness input value), Gamma (gamma value), Min (minimum brightness input value).

In order to obtain an appropriate dynamic range, adjust the shape of the setting value graph so that it approaches the cumulative degree graph as much as possible. Adjust so that the appropriate dynamic range is automatically obtained with the "Auto Adjust" button based on the currently displayed image.



| Set Value | Description |
|-----------|---|
| Max | Maximum brightness input value. Specify the luminance input value to represent white. (Range: 0 to 4095, initial value: 4095) |
| Gamma | Gamma value. It is used to make input / output characteristics nonlinear. (Range: 0.1 to 100, initial value: 1.0) |
| Min | Minimum luminance input value. Specify the luminance input value to represent black. (Range: 0 to 4095, initial value: 0) |

The outside of the set luminance input value is displayed as a blackout or a white overexposure.

When the relationship of values is "minimum brightness input value > maximum brightness input value", negative / positive inversion occurs. If you click the "Invert" button, the values of Max and Min will be exchanged.

When the gamma value is 1.0, the characteristic is linear (linear).

When the gamma value is decreased, the appearance of the dark area is emphasized.

When the gamma value is increased, the appearance of the bright part is emphasized.

Enhance

Sets the contour enhancement.

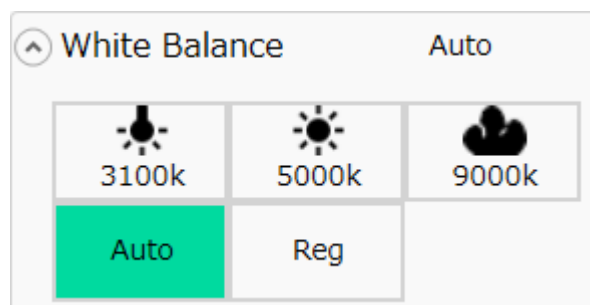
| Set Value | Description |
|-----------|-------------------------------|
| OFF | No contour enhancement. |
| LOW | Low contour enhancement. |
| MID | Standard contour enhancement. |
| HIGH | High contour enhancement. |

White Balance






Setting to match the white balance with the photographic environment.

The value set during selection is shown in green.

Selection of the setting is made by clicking the icon.



The white balance settings made from each icon are as follows.

| Icon and Name | | Description |
|---|------------|---|
|  | Lightbulb | Lighting color temperature set for 3100K. |
|  | Sunlight | Lighting color temperature set for 5000K. |
|  | Cloudy sky | Lighting color temperature set for 9000K. |
|  | Auto | Calculates the proper RGB gain value from the image currently displayed. |
|  | Reg | Uses the white balance saved in the SET REG function of the camera while photographing. |

Chroma

Sets the color concentration (chroma) and hue.

The color concentration (chroma) settings made from each icon are as follows.

| Set Value | Description |
|-----------|---|
| 0 % | Sets the chroma to 0%. Becomes a B/W image. |
| 50 % | Sets the chroma to 50%. |
| 100 % | Sets the chroma to 100%. Standard chroma. |
| 150 % | Sets the chroma to 150%. |
| 200 % | Sets the chroma to 200%. |

When CUSTOM item is checked off, preset values above can be set by moving the slider.

The hue setting can be adjusted from -180 to +180 [degree].

RGB Matrix

Sets RGB matrix correction for the image data.

| Set Value | Description |
|-----------|---------------------------------|
| ON | Enables RGB matrix correction. |
| OFF | Disables RGB matrix correction. |

Low Pass Filter

Smooth the image.

| Set Value | Description |
|-----------|--------------------------------------|
| ON | Enables low pass filter processing. |
| OFF | Disables low pass filter processing. |

Adjust Brightness/Contrast

Adjust the contrast and brightness of the image.

Input Black Level

Adjust the black level of the input data.

Superimpose



Superimposes information such as the frame number on the image.
Superimposed information is output to the image file after format conversion.
Items that can be superimposed are the same as the contents of the display in the download preview except for Comment. (refer to p.136)

Display the superimposed information off-screen.

Specifies whether the information will be superimposed inside or outside the image.

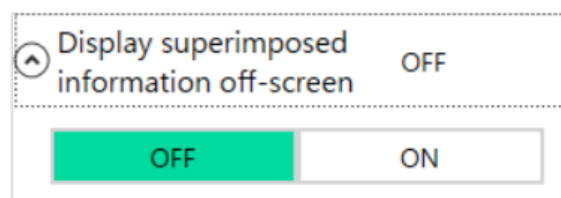


Image Rotation and Inversion



Opens the image reversal setting panel.

The same items as the Image Rotate Flip Panel called from the Camera Quick Toolbar are displayed. (refer to ⇒p.142)

Snapshot



Open the setting panel which saves the image displayed in the image display part as a snap.

Displayed items are same as the snapshot panel called from the camera quick toolbar except for "Filename Edit". (refer to ⇒ p.144)

Image Overlay



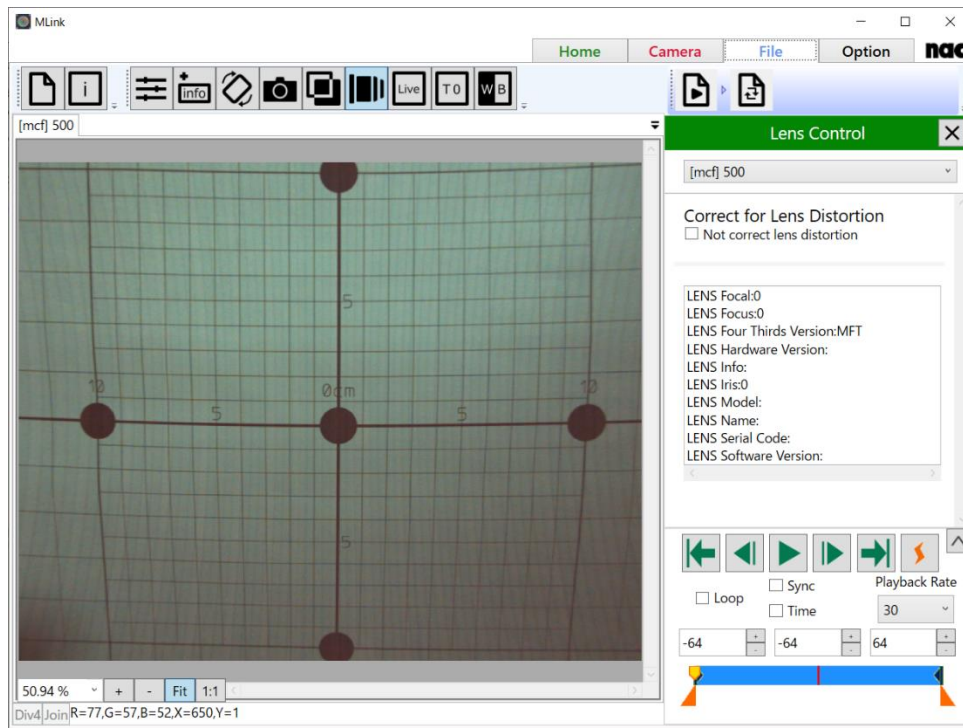
Opens the setting panel for overlaying and displaying still images on the image displayed on the image display section. The same item as the "Image superimposing" panel called up from the camera quick toolbar is displayed. (refer to ⇒ p.148)

Lens Control

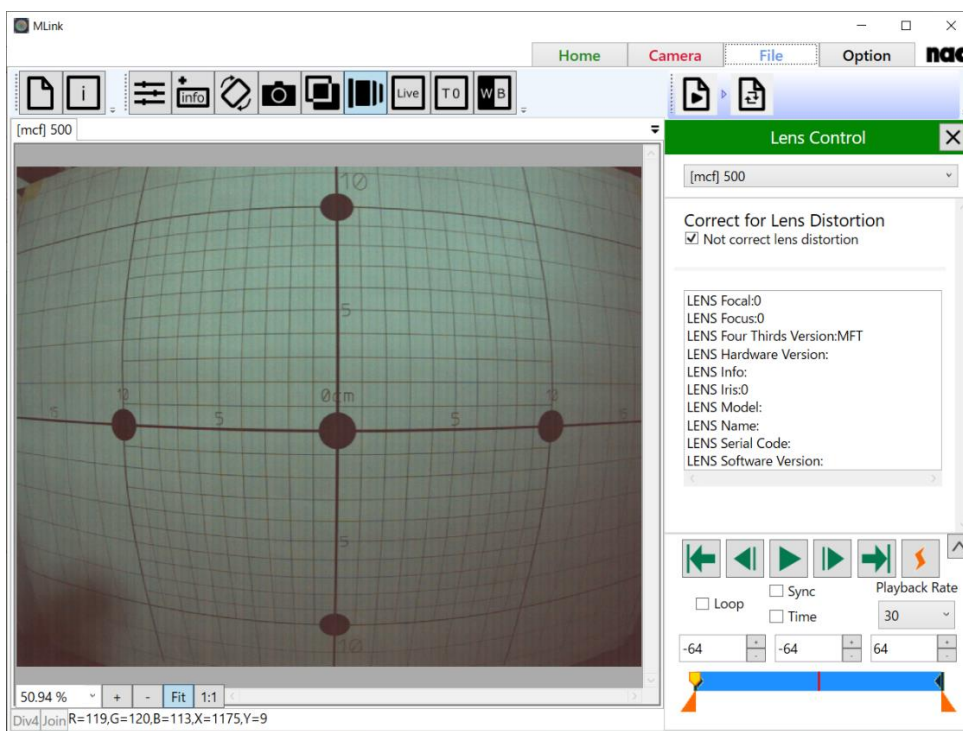


Display lens control information.

In addition, you can switch ON / OFF of lens distortion.



When you open a file which contains lens control information, lens control information list is displayed. If the "Not correct lens distortion" checkbox is checked, it displays images without correcting lens distortion.



T=0 Correction



The T=0 setting sets the frame to be the standard image file time to the desired frame.

By making the frame number on the camera for the frame input by the trigger number (trigger frame) during recording 0, review the image photographed and set the frame number of the image file to the T=0 setting to set the desired frame number to 0. The frame where the frame number is 0 is called the T=0 frame. This is a handy function if there are no trigger signals synchronized to the image or if there is a time difference between the frame to be the time standard for the photographed image and the trigger signal.

T0 Setting

[mcf] hx6 1493-N004_food-chart(F56)

^ Edit T0

Set T0 frame as

Current FrameSpecify Frame

Target Block

Current BlockAll Blocks

Target File

Current FileAll Files

Change T0 in current block

^ Reset T0

Block

Current BlockAll Blocks

Target File

Current FileAll Files

Reset T0

T0 Editing

Set T0 fame as

| Set Value | Description |
|---------------|---|
| Current Frame | Makes the frame shown the T=0 frame. |
| Specify Frame | Makes a specified frame number the T=0 frame. |

Target Block

| Set Value | Description |
|---------------|--|
| Current Block | Reflects the changes in the T=0 frame only for blocks including the frame shown. |
| All Blocks | Enabled only when a multi-trigger recorded file is open, the frame shown is made the T=0 frame and the |

| | |
|--|---|
| | variation between the T=0 frame and the trigger frame is reflected in other blocks in the file. |
|--|---|

Target File

| Set Value | Description |
|--------------|--|
| Current File | Reflects the changes in the T=0 frame only for file including the frame shown. |
| All Files | Enabled only when a multi-trigger recorded file is open, the frame shown is made the T=0 frame and the variation between the T=0 frame and the trigger frame is reflected in other blocks in the file. |

T0 Reset

Blocks

| Set Value | Description |
|---------------|--|
| Current Block | Sets the trigger frame for the block containing the frame shown as the T=0 frame. |
| All Blocks | Enabled only when a multi-trigger recorded file is open, the T=0 frame for all of the blocks in the file displayed is set as each trigger frame. |

Target File

| Set Value | Description |
|--------------|---|
| Current File | Reset the T=0 frame of the displayed file to the trigger frame. |
| All File | Reset T=0 frames of all displayed files to their respective trigger frames. |

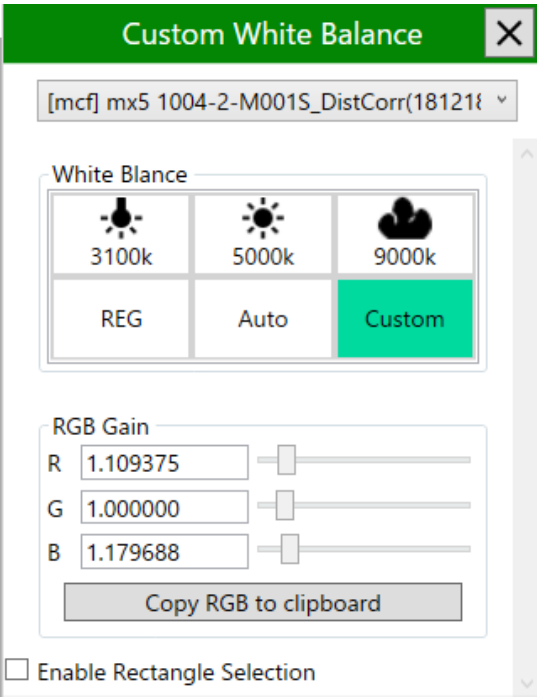
Custom White Balance



Adjusts the white balance by specifying an area in the image or by specifying the RGB gain value. The white balance can be set only when the white balance selection is set to "Custom". Otherwise, the RGB gain value is only displayed and can not be set.

When "Enable Rectangle Selection" is checked, you can specify the calculation area for white balance by clicking and dragging the rectangle area in the image. Once the area is specified, the white balance will be calculated and reflected in the image and RGB gain values.

Clicking the "Copy RGB to clipboard" button will copy the displayed RGB gain values to the clipboard.



HDR Settings



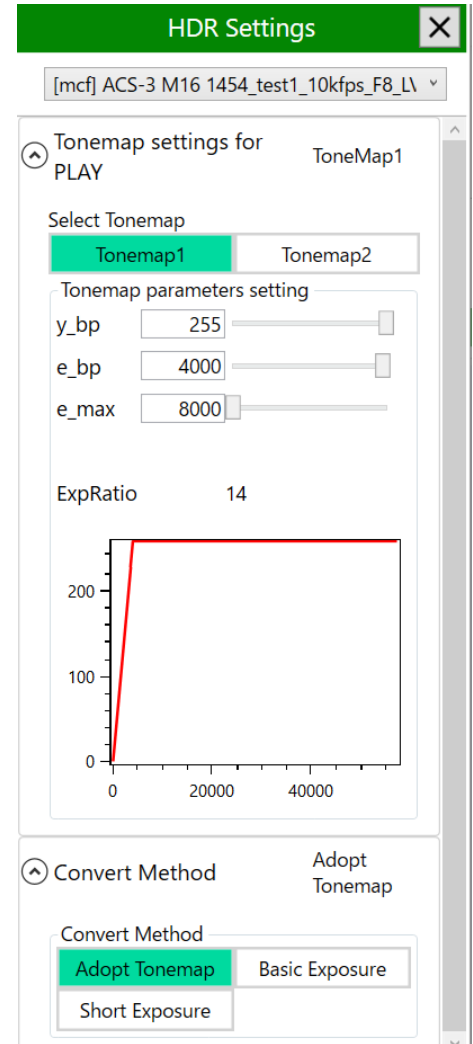
Set HDR function.

Tonemap Settings

The same items as Tonemap Settings of the HDR Settings panel called from the Camera Quick Toolbar are displayed.
 (refer to ⇒p.180)

Convert Method

You can select convert method of format conversion from "Adopt Tonemap", "Basic Exposure", and "Short Exposure". Select "Adopt Tonemap" to display the image that Tonemap Settings are applied. Select "Basic Exposure" to display the basic exposure image, and select "Short Exposure" to display the short exposure image.



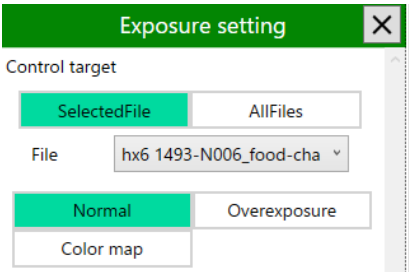
Exposure Setting



Colorizes images according to the pixel values. This function is useful for checking the amount of the light during recording.

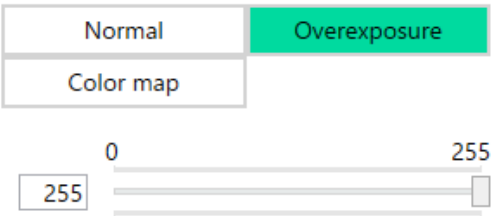
Normal

Displays the original image.



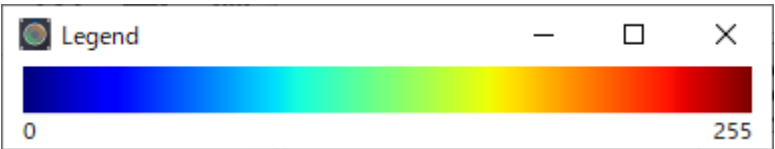
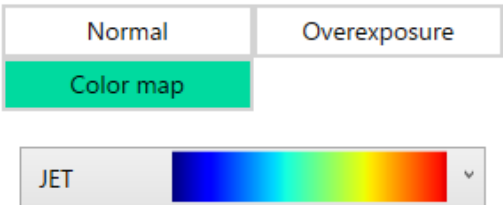
Overexposure

Displays the pixels whose luminance exceeds the threshold value in red. The threshold value can be adjusted with the slider.

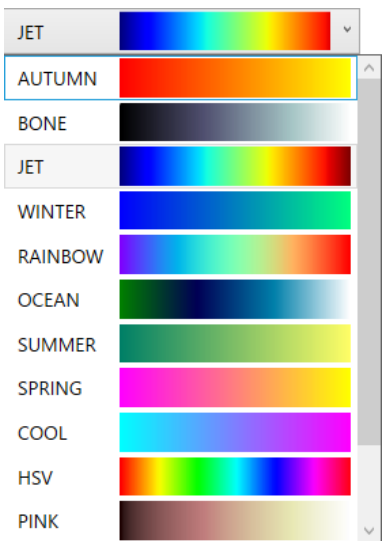


Color map

Maps luminance to color to display the image luminance in color. The artificial color and the luminance can be viewed in the Legend window. The luminance range and corresponding colors cannot be changed.



You can select a color map from the pull-down list as shown in the right figure.

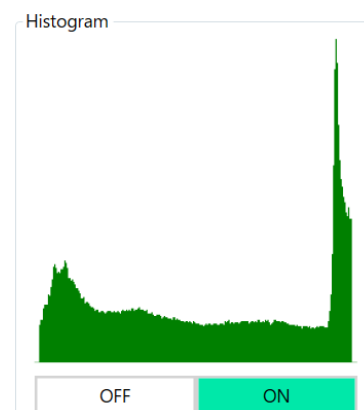


Histogram

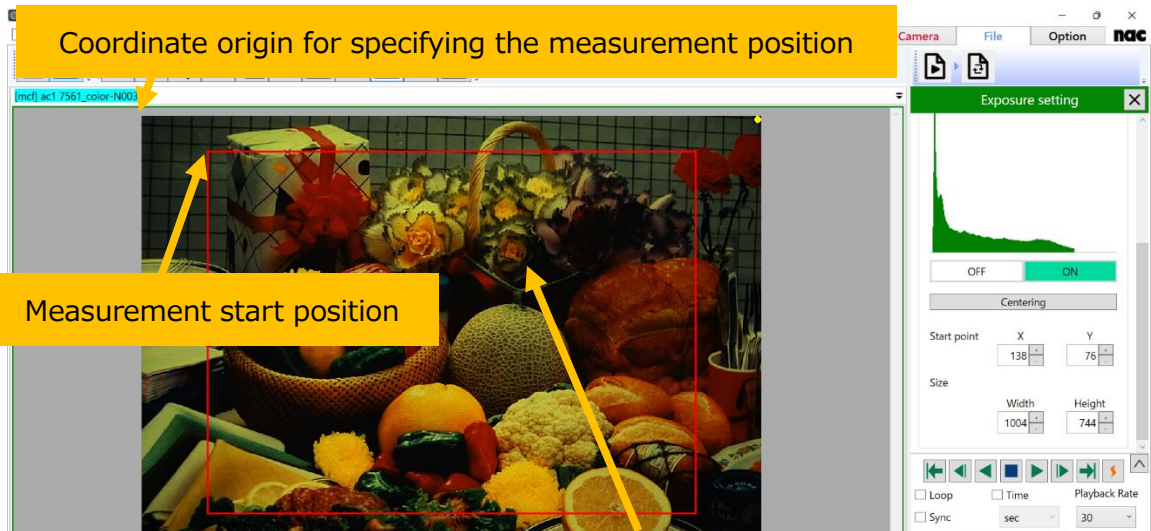
Displays the illuminance of the image as a histogram.

The range for measuring illuminance can be switched ON/OFF.

When ON, a red frame is displayed on the image to indicate the measurement range. You can specify the range by dragging on the image. You can also specify the start position and size of the measurement range by entering numerical values. If OFF, measurements are taken over the entire original image.



| Item | Description |
|-------------|---|
| Centering | Click the "Centering" button to move the center of the measurement range to the center of the image. |
| Start point | Specify the coordinates of the upper left corner of the measurement range as a number. The origin of the coordinates is the upper left corner of the image. |
| Size | Specify the size of the measurement range with a number. |



By dragging within the frame, you can change the measurement position.
By dragging the frame, you can adjust the size of the measurement range without changing its position.

Simple measurement

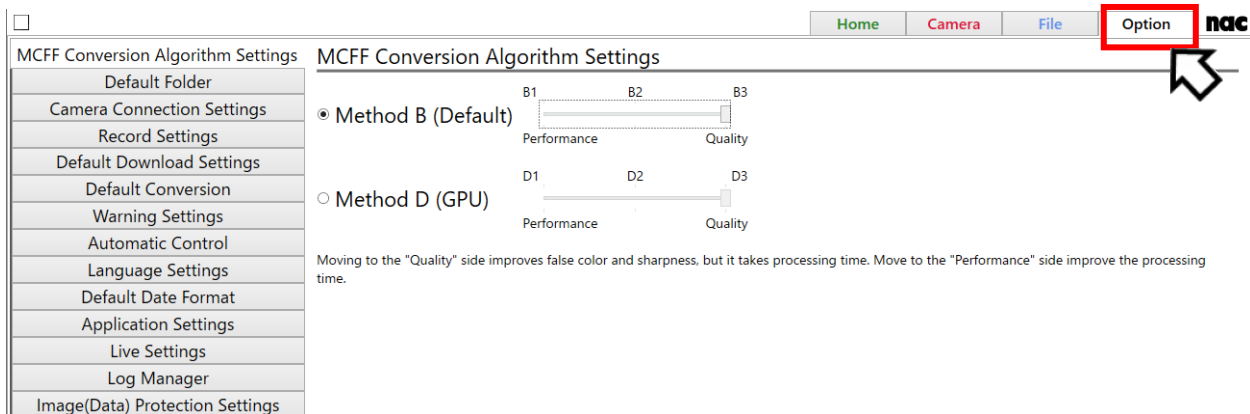


Provide simple image measurement.

The same items as the Image Simple measurement Panel called from the Camera Quick Toolbar are displayed. (refer to ⇒p.184)

4.4 Option Settings

Option settings are made in the **Option** tab. Select **Option** from the mode tab to show the screen below.



On the **Option** tab, you can make the following settings.

- **4.4.1 MCFF Conversion Algorithm Settings (refer to p.276)**

You can set the method of image conversion from MCFF.

- **4.4.2 Default Folder (refer to p.278)**

You can specify the input folder and save folder.

- **4.4.3 Camera Connection Settings (refer to p.279)**

You can specify the state of the camera after camera connection is completed.

- **4.4.4 Record Settings4.4.5 Default Download Settings (refer to p.282)**

You can set the default download format.

- **4.4.5 Default Download Settings4.4.5 Default Download Settings (refer to p.283)**

You can set the default download format.

- **4.4.6 Default Conversion (refer to p.284)**

You can set the default conversion format.

- **4.4.7 Warning Settings (refer to p.285)**

You can set the warning display.

- **4.4.8 Automatic Control (refer to p.286)**

You can set automatic control.

- **4.4.9 Language Settings (refer to p.290)**

You can set language of MLink.

- **4.4.10 Default Date Format (refer to p.290)**

You can set default date format.

- **4.4.11 Application Settings (refer to p.291)**

You can set application mode settings.

- **4.4.12 Live Settings (refer to p.293)**

You can set live settings.

- **4.4.13 Log Manager (refer to p.294)**

You can set log managing settings.

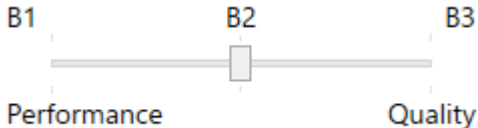
- **4.4.14 Image(Data) Protection Settings** 4.4.14 Image(Data) Protection Setting (refer to p.295)

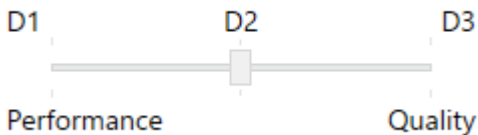
You can set the image protection settings.

4.4.1 MCFF Conversion Algorithm Settings

Sets the method for image conversion from MCFF.

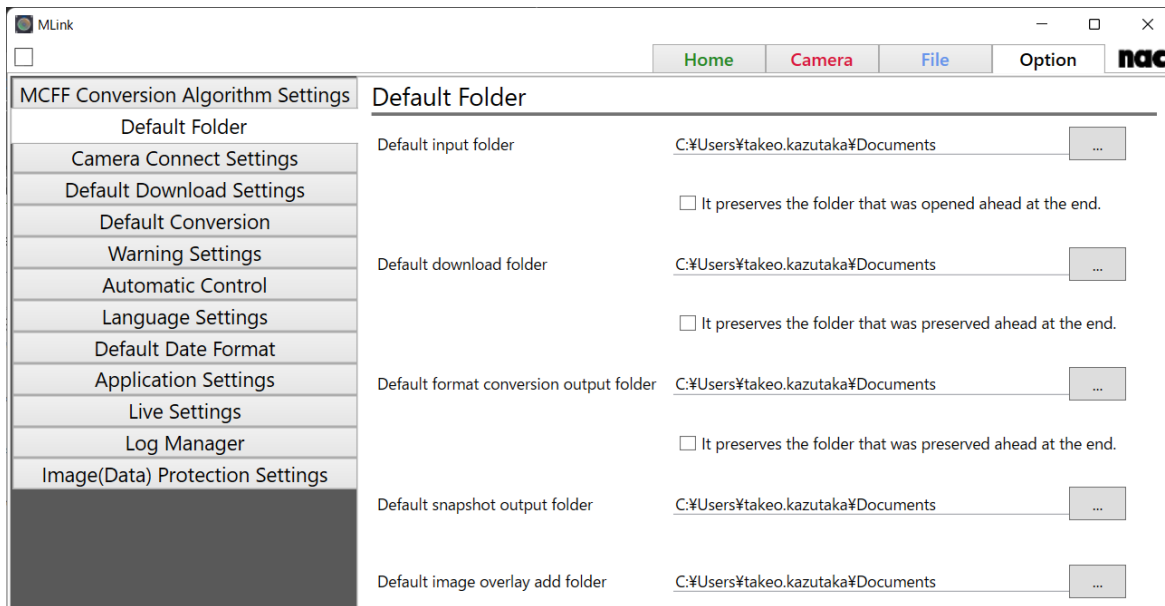
The conversion methods include the following two methods.

| Setting | Description |
|----------|--|
| Method B | <p>Default image conversion method. Select from method B1, B2, or B3.</p>  <p>Moving to the Quality side improves sharpness and reduces false color, but it takes more processing time. Move to the Performance side reduces the processing time.</p> |

| | |
|----------|---|
| | The default method is B3 in MLink 1.75a and later. |
| Method D | <p>Method uses a GPU device to playback and convert MCFF files with high performance. The methods D1, D2, and D3 have the save image quality as method B1, B2, and B3.</p>  <p>Moving to the Quality side improves sharpness and reduces false color, but it takes more processing time. Move to the Performance side reduces the processing time.</p> <p>The method D requires a CUDA-enabled GPU device. To use conversion method D, specify the device to be used with the utility software CudaSelect.exe.</p> |

4.4.2 Default Folder

Specify the input folder and the save folder.



| Setting | Description |
|---|--|
| Default input folder | Sets the folder to be referred when opening image file. |
| Default download folder | Sets the folder to be referred when saving the file to be downloaded. |
| Default format conversion output folder | Sets the folder to be referred when saving the file to be converted. |
| Default snapshot output folder | Sets the folder where files are output with snapshot. By default, it is "C: ¥ Users ¥ <user name> ¥ Documents". |
| Default image overlay add folder | Sets the folder referenced when adding overlay image. |

4.4.3 Camera Connection Settings

Specify parameters to be set for the camera when connecting the camera.

The screenshot shows the MLink software interface. On the left is a sidebar with a tree view of settings categories: MCF Conversion Algorithm Settings, Default Folder, Camera Connection Settings (selected), Record Settings, Default Download Settings, Default Conversion, Warning Settings, Automatic Control, Language Settings, Default Date Format, Application Settings, Live Settings, Log Manager, and Image(Data) Protection Settings. The main window is titled 'Camera Connection Settings' and contains the following sections:

- Camera mode after completion of connection:** A dropdown menu currently set to 'Live(View)'. Below it, a note states: 'After connecting is completed, set all cameras to Live (VIEW) mode.' To the right of the dropdown are two other options: 'Stop(Ready)' and 'Judge from recorded data'.
- On GxHub System:** A checkbox labeled 'On GxHub System' is unchecked. Below it is a checkbox 'After connecting is completed, read camera settings.' with a button to its right.
- After connecting is completed, read recording settings:** A checkbox is unchecked, with a button to its right.
- Automatic reading of Recording/Download settings:** A checkbox is unchecked, with a button to its right.
- Camera Registration:**
 - Type:** A dropdown menu showing 'GX-1'.
 - CID / Head ID:** A text field containing '0'.
 - Nickname:** An empty text field.
 - Buttons: 'Add', 'Modify', and 'Remove'.
 - A table with columns: Type, CID / Head ID, Nickname.
 - Buttons: 'Save' and 'Cancel'.
 - Text: 'Load registered information in HXLink(MEMRECAM.tbl)'.
 - Buttons: 'Export' and 'Load'.

Camera mode after completion of connection

Set the state of the camera after camera connection is completed.

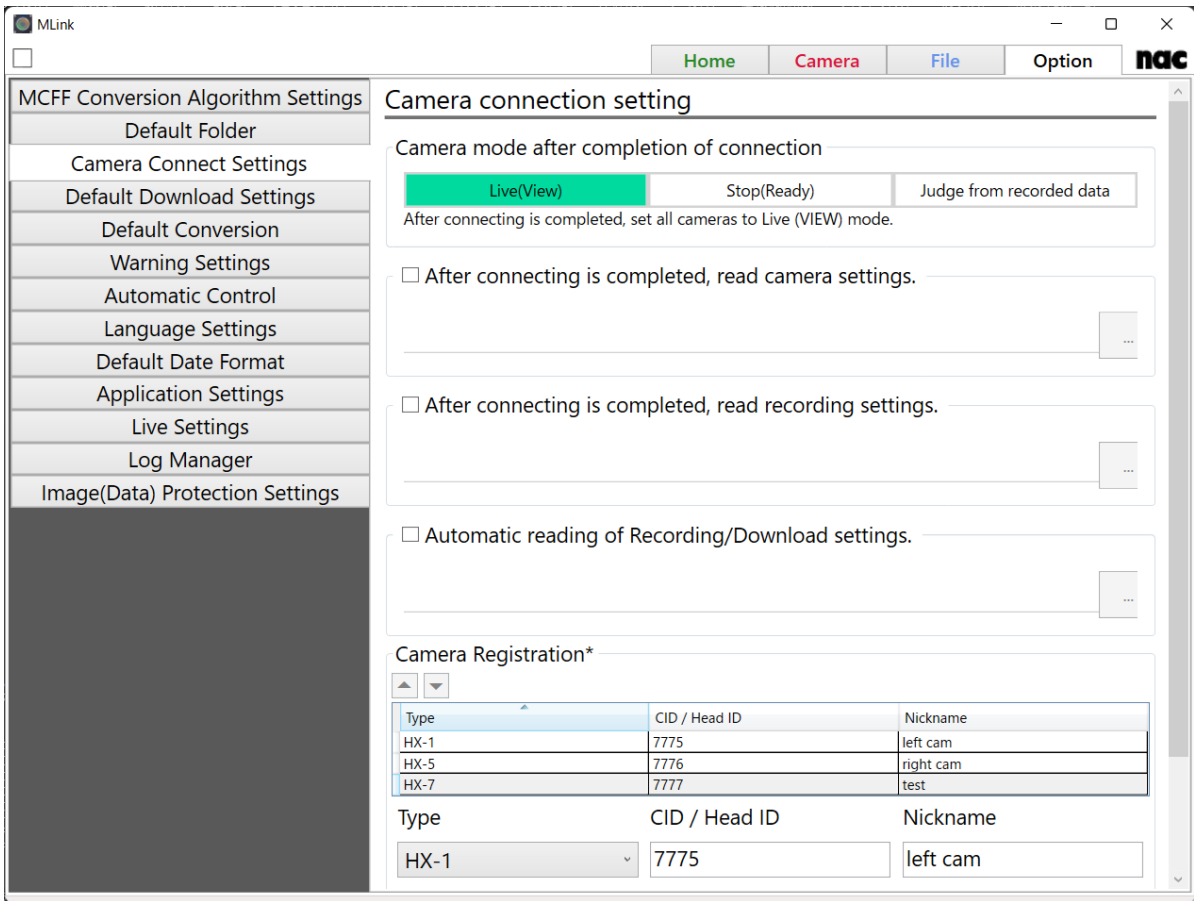
| Setting | Description |
|--------------------------|---|
| Live (VIEW) | After the connection is completed, put all cameras in the live (VIEW) state. Since you can check live images immediately, you can prepare shooting smoothly. |
| Stop (READY) | After connection is complete, put all cameras in READY state. This is convenient when you connect to download recorded data from a camera shot offline, or to change the shooting menu that can be changed only in the stop (READY) state. |
| Judge from recorded data | If there is recorded data of one of the cameras to be connected, put the camera in the READY state after connection. If there is no recorded data, put the camera in the live (VIEW) state. |

Operate with the GX-HUB system

If the check button is checked, the cameras connected to the GX-HUB are operated by the GX-HUB system and the cameras are synchronized. However, in this state, synchronization by external signals such as EST synchronization is not performed.

After connecting is completed, read recording settings

After the connection is completed, read the file containing the recording setting and set it to the camera.
When the check button is checked and the recording setting file is specified, the setting is reflected in the camera.



Automatic reading of Recording/Download settings

When the live (VIEW) button is clicked, the recording setting file is loaded. When download list is displayed, conditions such as download range are read.
This means that if the check button is checked and the setting file is specified, the contents of the setting file will be reflected.

Clicking the "Save Recording / Download Setting" button on the download list of these setting files will output the camera's recording settings and download settings to the file at that time. For more information, refer to **p.91**.

Camera Registration

You can register cameras by Type, CID, Head ID, and Nickname. The list of registered cameras is displayed at the bottom of the window. To change the order, select a camera and click the arrow icons.

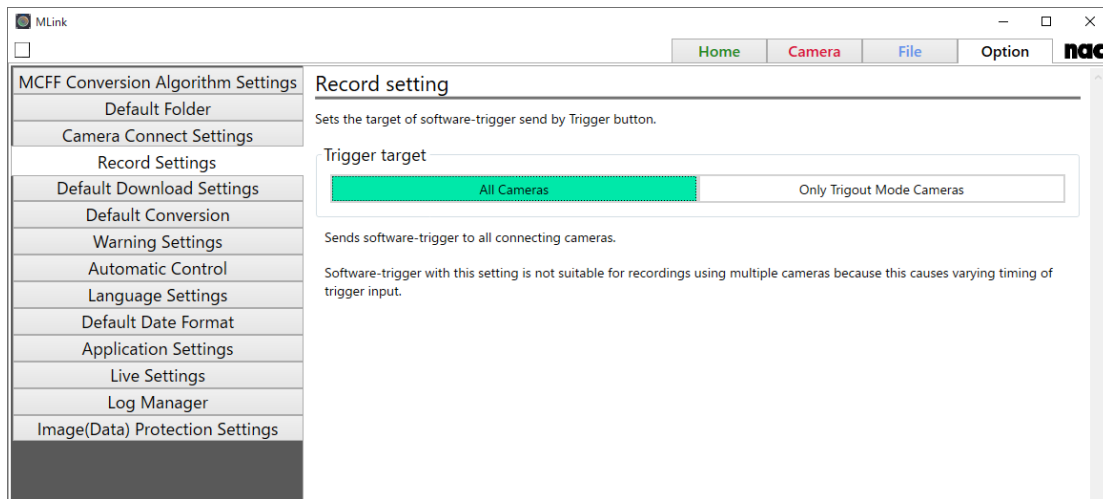
| Setting | Description |
|-----------------|--|
| Type | Select a camera type to add. |
| CID / Head ID | Enter the CID or Head ID of the camera to add. Specify Head ID when registering a camera head of multi-head type device. |
| Nickname | Enter a nickname given to the camera to add. Nickname must be unique, and you cannot use the nickname already used. Nickname can also be edited in "Reset" -> "Nickname" of "Recording Setting". For more information, refer to p.71 . |
| [Add] button | Registers the camera specified by Type, CID/Head ID, Nickname above. |
| [Modify] button | Modifies the information of the registered camera selected in the list to the one specified by Type, CID/Head ID, Nickname above. |
| [Remove] button | Removes the information of the registered camera selected in the list. |
| [Save] button | Updates camera registration settings with the list. |
| [Cancel] button | Discards unsaved camera registration settings. |
| [Export] button | Exports camera registration settings to a camera information setting |

| | |
|---------------|--|
| | file(*.tbl). |
| [Load] button | Loads a camera information setting file(*.tbl) and adds the information to the list. |

Changes in the registered camera list is temporary and will be discarded if it was not saved.
To confirm the changes, select the **Save** button,

4.4.4 Record Settings

Sets the target of software-trigger send by Trigger button.



- All cameras

Sends software-trigger to all connecting cameras.

Software-trigger with this setting is not suitable for recordings using multiple cameras because this causes varying timing of trigger input.

- Only cameras with TRIGOUT enabled

Sends software-trigger to only cameras with Trigger Output is enabled.

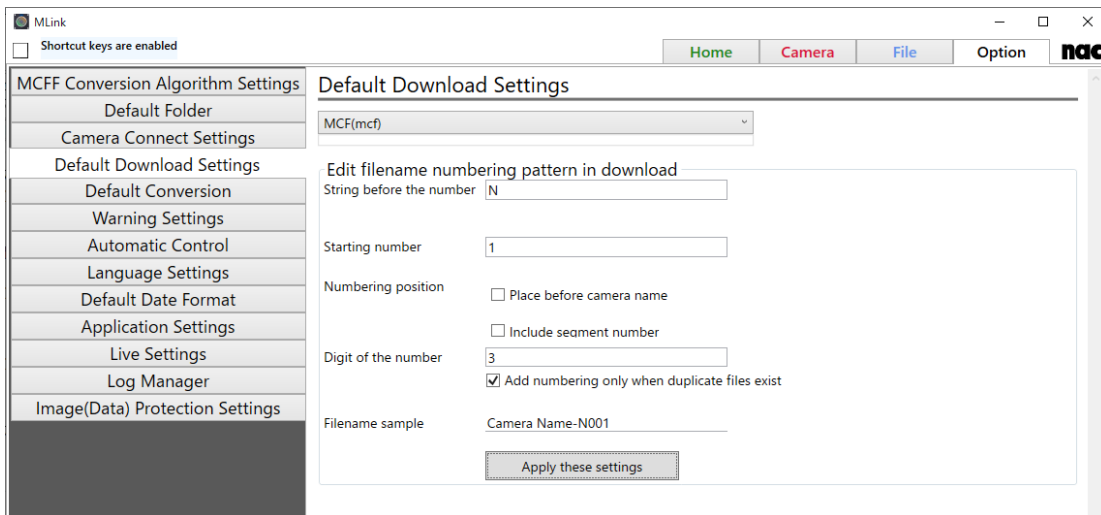
In this setting, MLink sends software-trigger to only the leader camera to causes the leader camera to output a TRIGOUT signal.

To perform synchronized recording with this setting, set one camera as a leader and set others as followers. For the leader camera, set the Trigger Output Mode to TRIGOUT, and set Trigger Output Mode to STATUS for followers. Ensure that the TRIGOUT signal from the

leader camera is input to the follower cameras as the trigger.

This settings is useful for synchronized recordings using cameras including HX-7S, ACS series, or GO series cameras.

4.4.5 Default Download Settings



Sets the default download format. (AVI, TIFF, JPEG, BMP, MCFF)

When AVI format is selected, you can set "Compression Program", " Compression Quality", and "Play Rate". When "CODEC" is selected in "Compressed program", conversion is performed by the method selected from the compressed program (codec) registered in Windows.

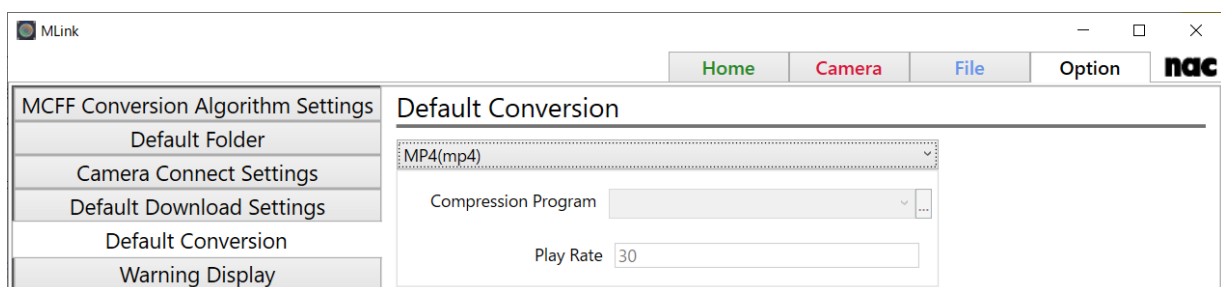
We are not responsible for codecs other than nac M - JPEG codec. For inquiries about codecs, please contact the manufacturer of the codec.

Also, edit the numbering of the file name when downloading from the following items.

Clicking the "Apply these settings" button will apply this setting to both individual and batch downloads.

| Setting | Description |
|--------------------------|---|
| String before the number | Specify any string at the beginning of numbering. |
| Starting number | Specify the starting number for numbering. |
| Numbering position | "Place before camera name" ⇒adds numbering in front of camera name. "Include segment number" ⇒adds segment number to the file name. Example) Camera_Name-M001.mcf |
| Digit Of the number | Specify the number of digits for numbering. If the actual number of digits in numbering does not reach the number of digits specified here, surplus is filled with 0. if you select " Add numbering only when duplicate files exist ", numbering will be added only if there are duplicate files in the download folder. |

4.4.6 Default Conversion



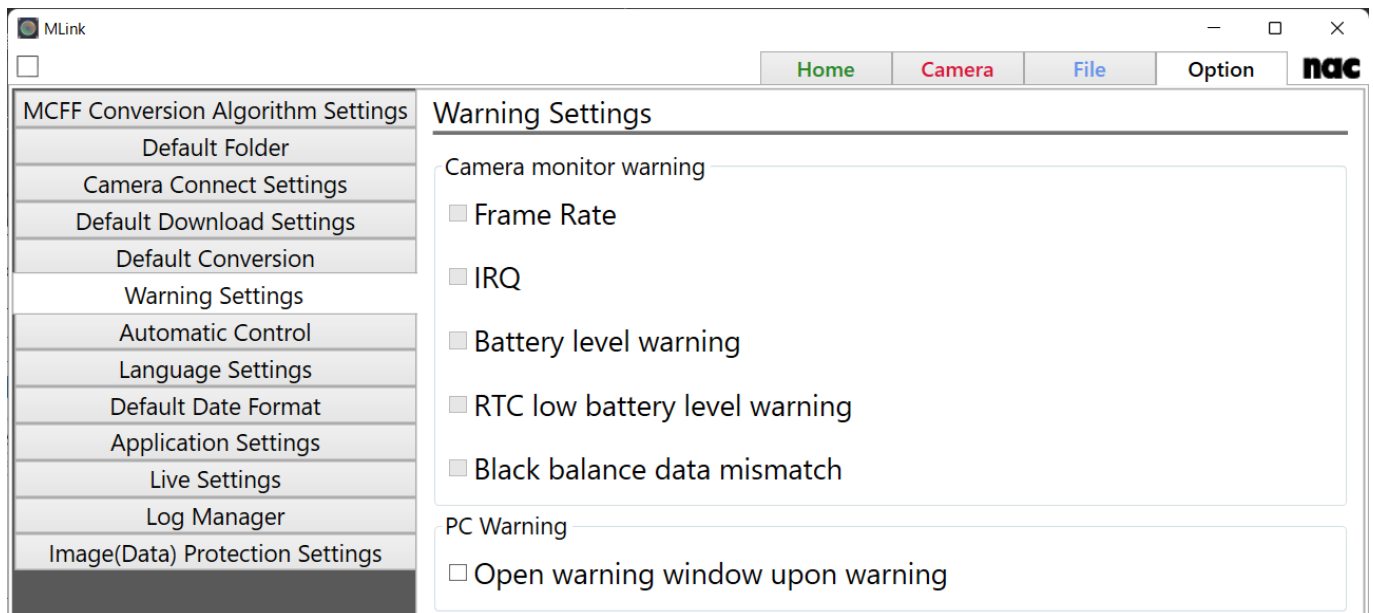
Sets the default conversion format. Settings for camera image files (MCF) previously opened can be applied.

When AVI format is selected, you can set "Compression Program" and "Play Rate". When "CODEC" is selected in "Compressed program", conversion is performed by the method selected from the compressed program (codec) registered in Windows.

We are not responsible for codecs other than nac M - JPEG codec. For inquiries about codecs, please contact the manufacturer of the codec.

4.4.7 Warning Settings

Set whether to enable or disable the camera warning display for each item. Enabling this setting will also show alerts in MLink's alert window. If cameras are connected, set parameters for all cameras. If the camera is not connected, the items that change camera parameters cannot be set.



Check the following items to display the corresponding warnings in the video and warning window.

| | |
|-------------------------------|---|
| Frame Rate | Abnormal recording speed |
| IRQ | Abnormal video update timing |
| Battery level warning | Battery voltage is out of specification or abnormal |
| RTC low battery level warning | watch battery low |
| Black balance data mismatch | Frame size, recording speed, or shutter changed after performing a black balance update |

Also, if you select "Open warning window upon warning", even if the warning window is closed, the warning window will be automatically displayed when warning conditions occur on the camera side.

4.4.8 Automatic Control

Auto Save

Automatic Control

Auto Save

☐ Specify by time

☐ Download automatically after recording.

Save as "Default Download Settings" and save in "Default download folder".

Move to Default Download Setting

Move to Default Folder Settings

☒ Save all range.

Saving time range for automatic download. [Frame] To [Frame]

☐ To ARM Mode after downloading

☐ Launch the application after download.

...

☐ Convert automatically after downloading.

Save as "Default Conversion" and save in "Default format conversion output folder".

Move to Default Conversion

Move to Default Folder Settings

☒ Save all range.

Saving time range for automatic conversion. [Frame] To [Frame]

☐ Convert in a separate process after downloading.

Continuous recording is possible by format conversion in a separate process.

Conversion Format

Compression Program

Compression Quality

Play Rate

Conversion Range ~ Frame

MCFF Conversion Algorithm Settings

Information about the conversion settings file being applied

| Title | Value |
|-------|-------|
|-------|-------|

Sets up the downloading of the movie after recording is complete and the conversion after downloading is complete.

Status of Auto Save setting is reflected in Recording Setting panel. For more information, refer to **p.72**.

Download automatically after recording is finished

If checked, MLink automatically downloads files after each recording. The file format for auto download follows the **Default Conversion** setting, and the download folder follows the **Default download folder** setting.

| Control | Description |
|---|--|
| <input checked="" type="checkbox"/> Specify by time | If checked, the unit of save range is second. If the checkbox is not checked, the unit of save range is frame. |

| | |
|--|---|
| Move to Default Download Setting | Transitions to Default Download Setting. |
| Move to Default Folder Settings | Transitions to Default Folder Settings. |
| <input checked="" type="checkbox"/> Save all range. | If checked, all of the recorded range is subject to download. |
| <p>Saving time range for automatic download.</p> <p>-0.05 sec To 0.3 sec</p> | Enter the start time and the end time of the save range for automatic download. |
| <input type="checkbox"/> To ARM Mode after downloading | If checked, the camera mode automatically transitions to ARM after downloading is complete. |
| <input type="checkbox"/> Launch the application after download. | If checked, the specified application is launched after downloading is complete. |

Convert automatically after downloading

If checked, MLink automatically converts files after download. The file format for auto download follows the Default Conversion setting, and the download folder follows the Default download folder setting.

This function will be disabled if **Convert in a separate process after downloading** is checked.

| Control | Description |
|---|---|
| Move to Default Conversion | Transitions to Default Conversion. |
| Move to Default Folder Settings | Transitions to Default Folder Settings. |
| <input checked="" type="checkbox"/> Save all range. | If checked, all of the recorded range is subject to conversion. |

Convert in a separate process after downloading

The converted files are saved in the same directory as the MCFF download folder. You can check and change the MCFF download folder in **Default download folder** setting.

- ☒ Convert in a separate process after downloading.

Continuous recording is possible by format conversion in a separate process.

Information about the conversion settings file being applied

| Title | Value |
|---------------------------|---------|
| Conversion Format | AVI |
| Compression Program | MJPEG |
| Compression Quality | 80 |
| Play Rate | 30 |
| MCFF Conversion Algorithm | B3 |
| Conversion Range (START) | 0 Frame |
| Conversion Range (END) | 0 Frame |

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| | |
|--|---|
| | Program, this control is hidden. |
| Play Rate | Enter the play rate of AVI file. The play rate can be specified in the range from 1 to 60. The unit of the play rate is fps. When any conversion formats other than AVI is selected, this control is hidden. |
| Conversion Range | Enter the conversion range. If the range of MCFF, the basis of conversion, is narrower than the range specified here, then the conversion range is according to the range of MCFF. |
| MCFF Conversion Algorithm Settings | Transitions to MCFF Conversion Algorithm Settings. For more information, refer to p.276 . |
| Create conversion settings files | Creates the conversion setting file(.fcv) based on above settings. |
| Information about the conversion settings file being applied | Displays information about the conversion setting file currently applied. When the conversion setting file is updated with Create conversion settings files , this information is also updated. |

In following cases, “Download automatically after recording is finished”, “Convert automatically after downloading” and “Convert in a separate process after downloading” is disabled.

- A recording trigger mode with automatically memory segment shift is AUTO or LOOP is selected. For more information, refer to p.110.
- During recording, the recording is stopped by clicking on “STOP” button in control panel.

Apply FCV

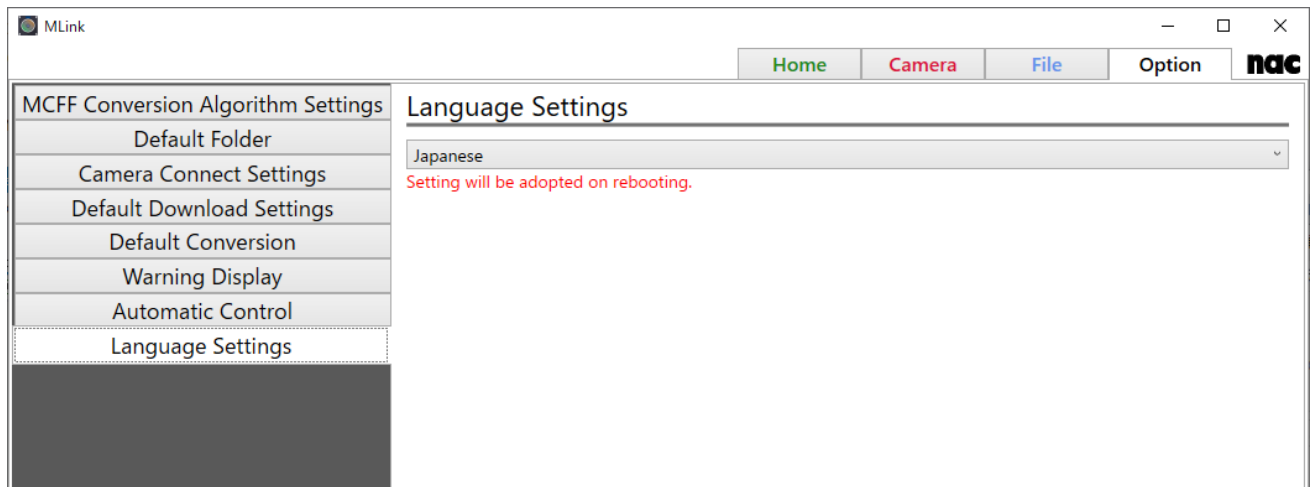
Apply FCV

☐ Apply following setting automatically when opening MCFF

...

If **Apply following setting automatically when opening MCFF** is checked and a conversion setting file is selected, the conversion setting will automatically be applied when opening MCFF files.

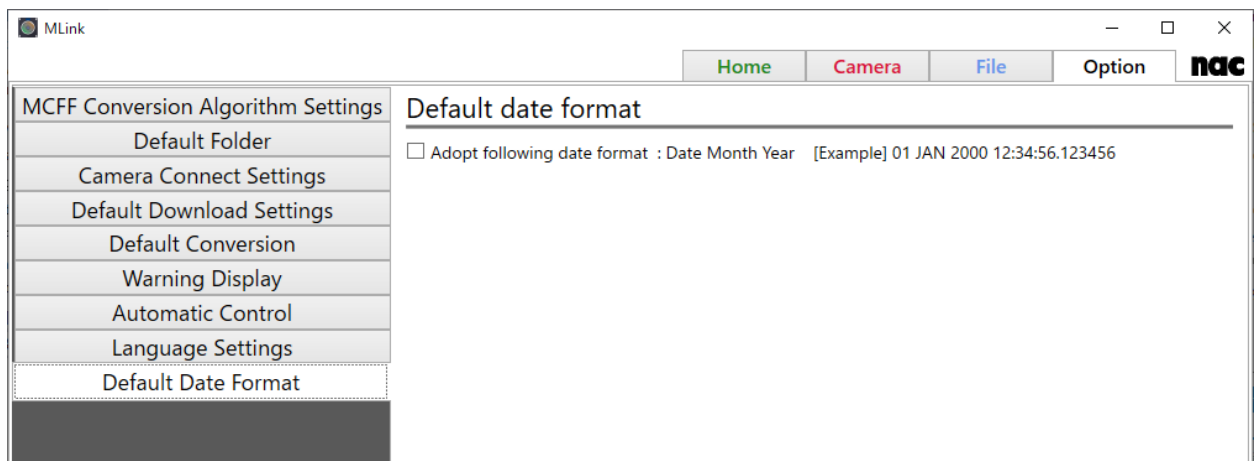
4.4.9 Language Settings



Set the language that you use in MLink.

You can select a language by clicking the pull-down menu. Please reboot MLink to apply the setting.

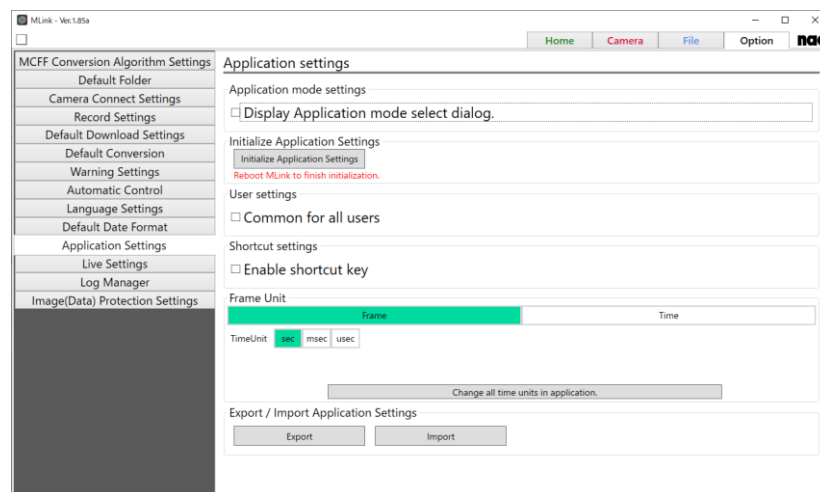
4.4.10 Default Date Format



Switch date format.

This setting is adopted to superimposition for file.

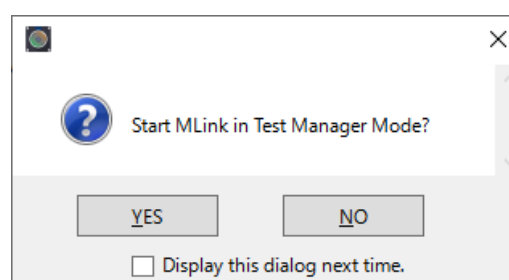
4.4.11 Application Settings



Application Mode Setting

This setting is for MLink Test Manager, a paid option. Using MLink Test Manager, you can manage test information and easily operate synchronous recording using multiple cameras. To use this option, you need a USB dongle key.

If **Display Application mode setting dialog.** is checked and a USB dongle key is plugged into your PC, the following dialog will appear at the next start of MLink. Select **YES** to start MLink in Test Manager mode. If the checkbox is not checked, MLink will start in the same mode as the last time. If there is no license key, MLink always starts in normal mode.



For more information about MLink Test Manager, please contact our sales staff.

Initialize Application Settings

Reset MLink settings except "Language settings."

To complete the reset, reboot MLink after selecting "Initialize Application Settings".

User settings

You can select whether to make MLink settings common to all users.

When the check box is checked, the settings common to all users will be used.

Shortcut settings

You can enable and disable shortcut keys.

When the check box is checked, the following shortcut keys are enabled.

The file name and extension of snapshot follow to the settings of Snapshot Settings panel.

| Shortcut Key | Action |
|----------------------|---|
| Ctrl + F | Save the snapshot of active file. |
| Ctrl + Alt + F | Save the snapshots of all opening files. |
| Ctrl + C | Save the snapshot of active camera. |
| Ctrl + Alt + C | Save the snapshots of all connecting cameras. |
| Ctrl + M | Switch camera mode. When camera mode is READY: Switch to VIEW When camera mode is VIEW: Switch to ARM When camera mode is ARM: Switch to REC |
| Ctrl + Space | Play/Stop |
| Ctrl + Shift + Space | Reverse play |
| Ctrl + → | Step one frame forward. |
| Ctrl + ← | Step one frame backward. |
| Ctrl + Tab | Switch tabs. |

When shortcut keys are enabled, the message "Shortcut keys are enabled" is displayed in the upper left corner of the window.



MLink



Shortcut keys are enabled

Frame Unit

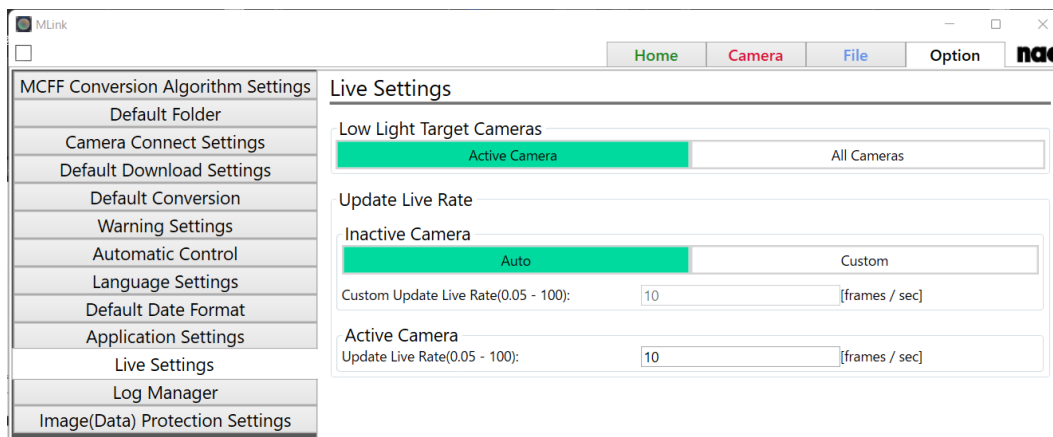
Set the frame/time display settings to be displayed by MLink in a batch. When setting by time, you can also select the time unit can also be selected. Click the **Change all time units**

for applications button to apply the settings.

Export/Import Application Settings

Exports and imports application settings of MLink. The **Import** button is disabled while connecting to cameras or opening files.

4.4.12 Live Settings



Configure live settings for the connected camera.

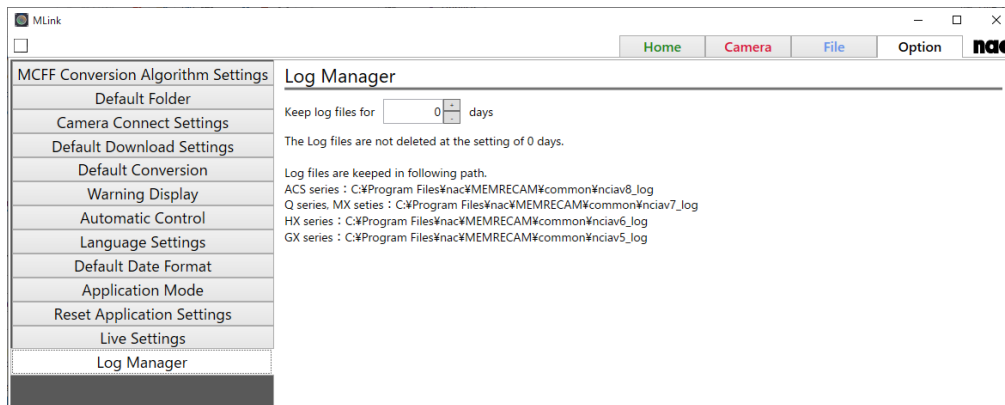
Low Light Target Cameras

Sets the camera to adapt low light. When "Active Camera" is selected, low light is applied to the camera that is operating the screen. If "All cameras" is selected, low light will be applied to all connected cameras.

Update Live Rate

| Set Value | Description |
|-----------------|---|
| Inactive Camera | Set the update rate of the live video of the camera when the screen is not being operated. If you select "Custom", you can change the number of frames updated per second within the range of 0.05 to 100. |
| Active Camera | Set the update rate of the live video of the camera that is operating the screen. You can change the number of frames updated per second within the range of 0.05 to 100. |

4.4.13 Log Manager

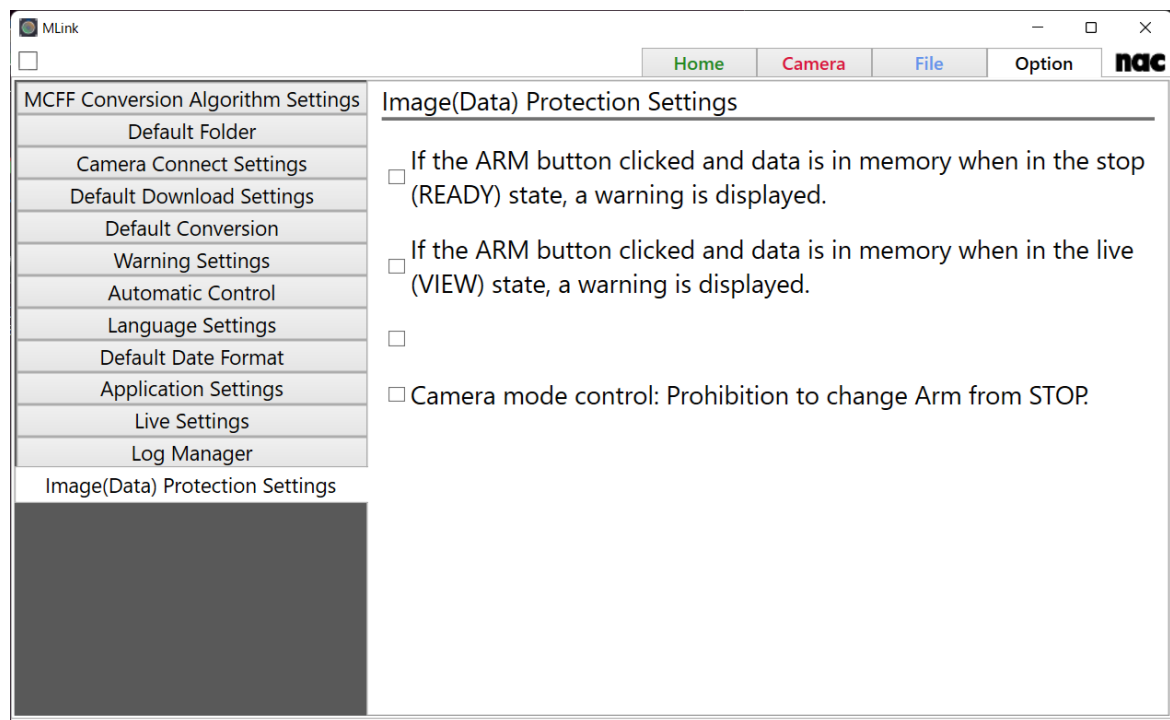


Sets log managing settings.

The log file is used for MLink and camera maintenance.

| Setting | Description |
|---------|---|
| Days | Sets the number days to keep log files. Log files will not be deleted when you set this value to 0. |

4.4.14 Image(Data) Protection Settings



You can set the warning display for image protection.

By checking the check box, you can display warning messages and restrict functions when each condition corresponding to the check box occurs.

4.5 Monitor

The monitor can be used as follows.

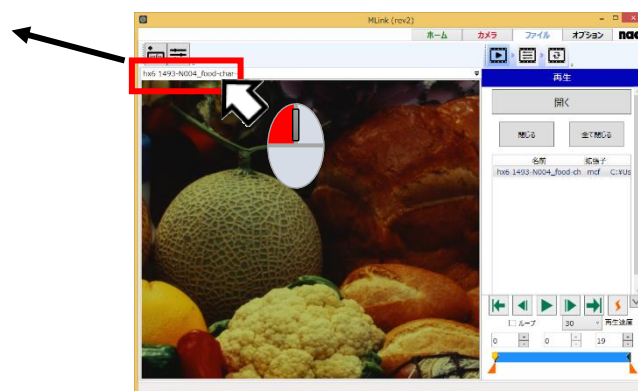
- 4.5.1 Split Monitor from the Main Window
- 4.5.2 Display the Image on the Whole Screen
- 4.5.3 Zoom In/Out, Scroll, Fit to Screen, Pixel Display
- 4.5.4 Display the cursor position and RGB value
- 4.5.5 Display Files Side by Side
- 4.5.6 Switch display tone

4.5.1 Split Monitor from the Main Window

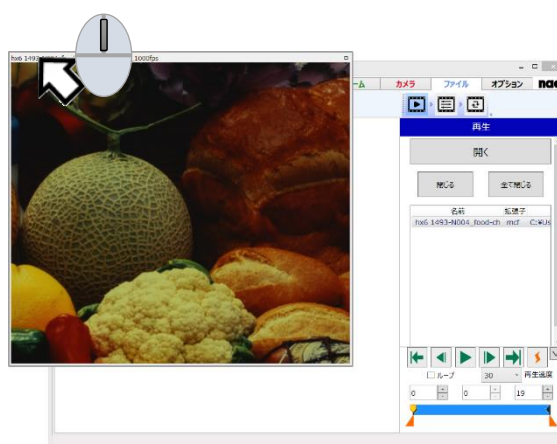
Split the monitor from the main window according to the following procedure.

The split image display can be moved and resized.

- 1) Drag the cursor while left clicking the mouse the tab on the monitor.




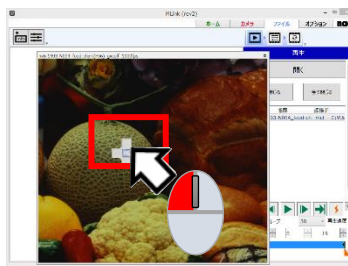
2) After dragging the image display to the location desired, release the left mouse button.



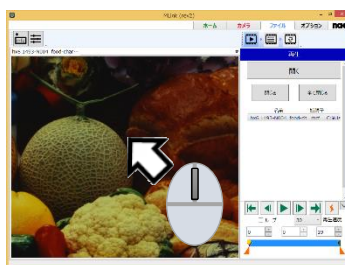
Use the following procedure to return the split monitor from the main window.

1) With the image display still dragged, move to the original image display on the main window.

If the cross mark  is shown, move the cursor to the center of the cross while it is still being dragged.

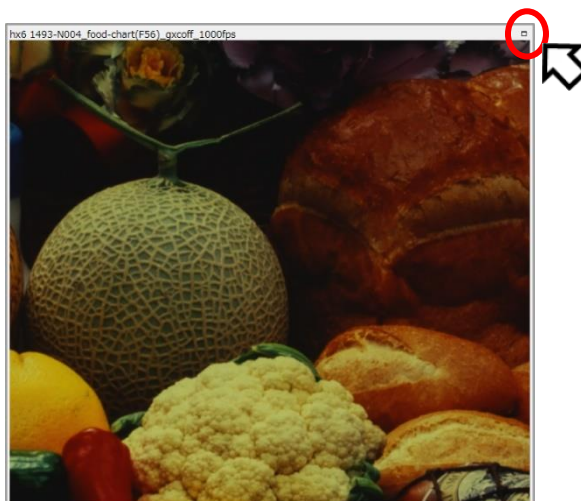



2) Release the left mouse button.

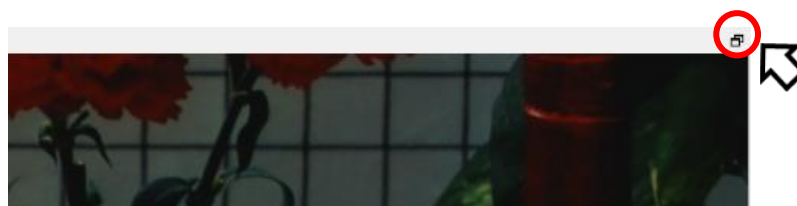


4.5.2 Display the Image on the Whole Screen

Click  located on the top right of the monitor to show the image on the whole screen.

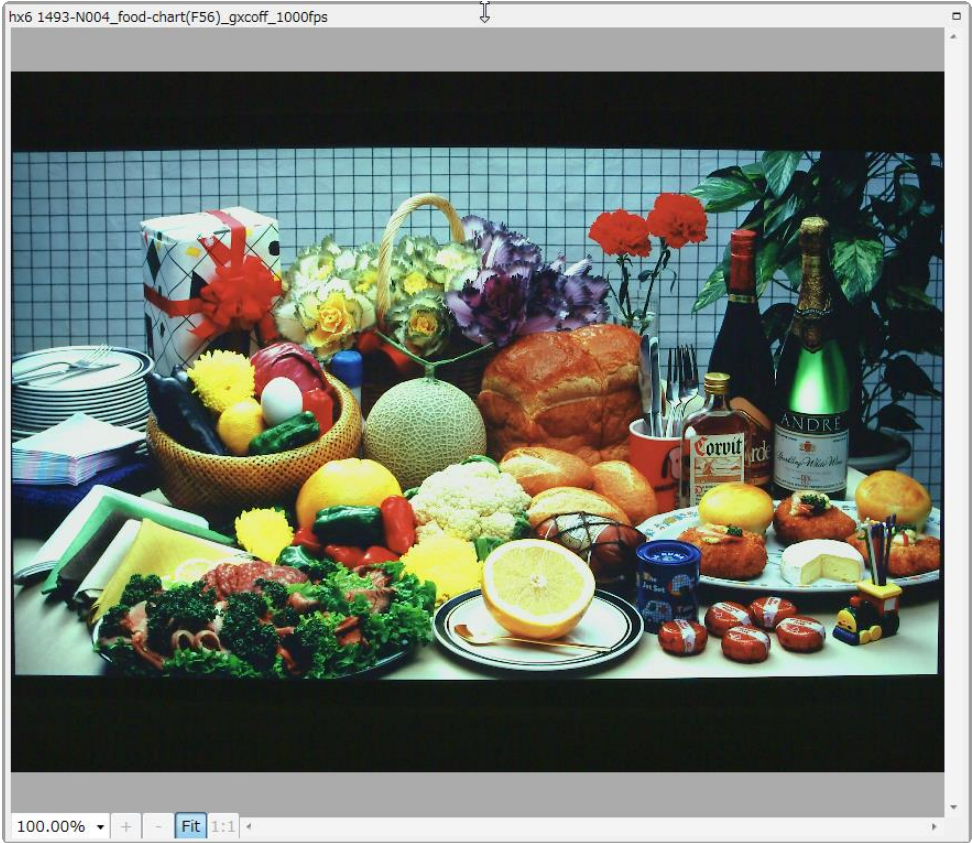


To return to the original image display size, click  on the top right of the monitor in the same manner.

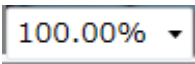






4.5.3 Zoom In/Out, Scroll, Fit to Screen, Pixel Display

Use to controls on the bottom left of the monitor to zoom in/out the image, scroll, fit to screen and pixel display.

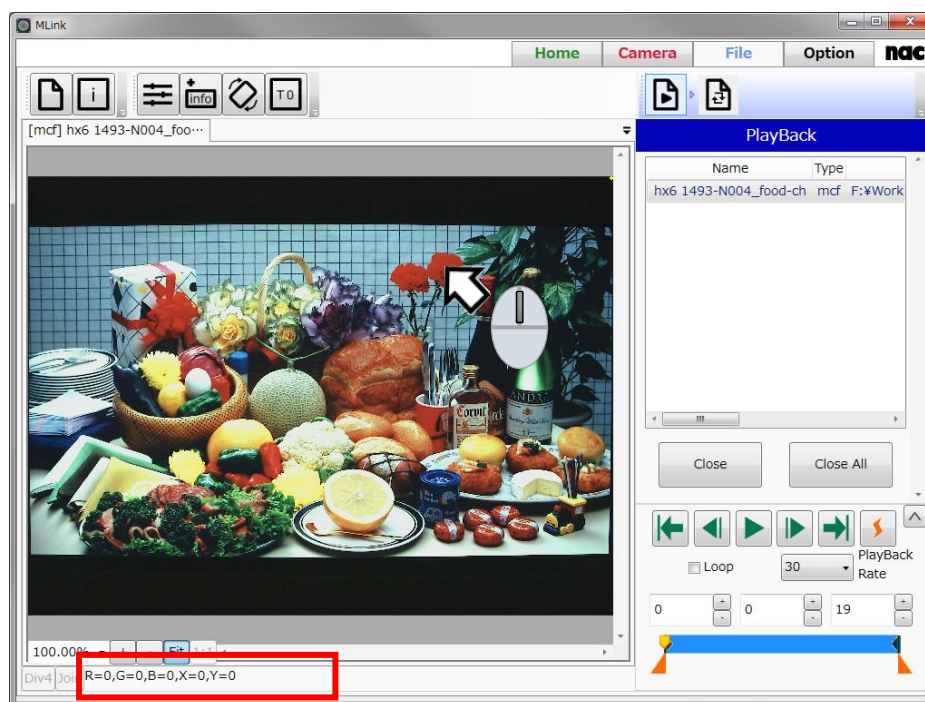


Operation of each control is as follows.

| Control | Name | Operation |
|---|------------------------------|---|
|  | Actual size | Shows actual size. Select from 25.0%, 50.0%, 75.0%, 100.0%, 150.0% and 200.0%. Numbers can be input. |
|  | Zoom In | Displays up to double the size. |
|  | Zoom Out | Displays up to ½ the size. |
|  | Display Range FIT Display | Fit the displayed image to the size of the display area. |
|  | Actual Size | Displays the image actual size as the pixel size on the PC screen. |

4.5.4 Display the cursor position and RGB value

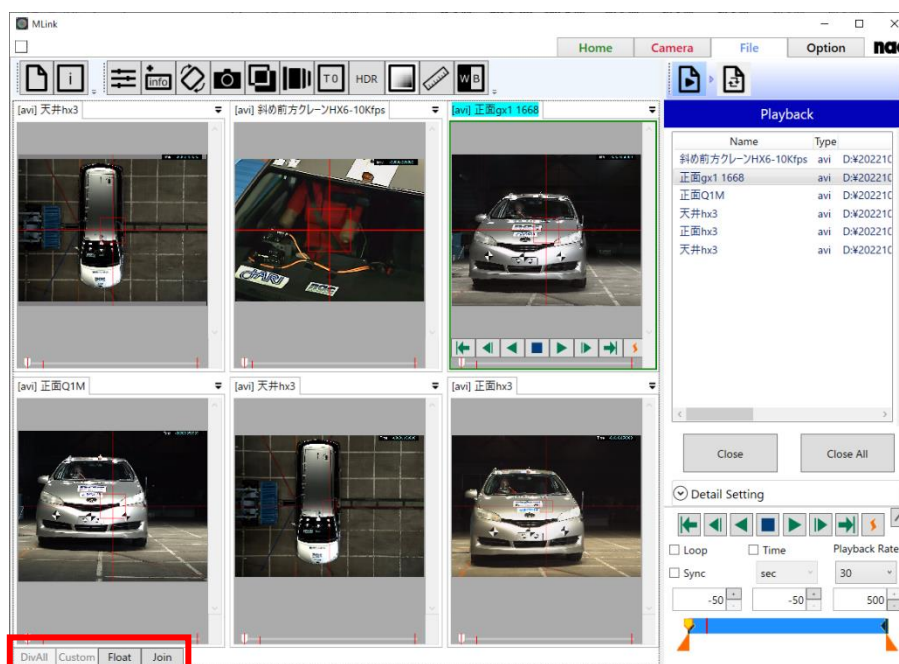
When the cursor is on the image display part, the position of the cursor (the origin at the upper left of the image is the origin) and RGB values of the image at that position are displayed on the status bar.




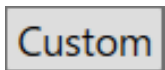
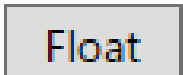

4.5.5 Display Files Side by Side

You can play images while reviewing them by opening multiple files and displaying images side by side.

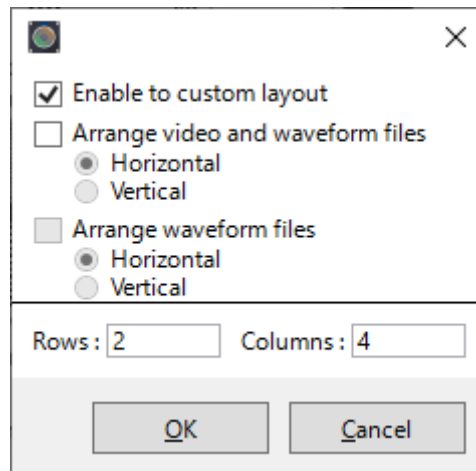
You can playback images individually with the control panel displayed in active window.



With the buttons on the status bar, you can display the windows side by side and overlay them.

| button | name | Operation |
|---|-------------------|---|
|  | Split | Displayed image size is divided into 3 columns with any rows, and display images are displayed side by side. It can be selected when two or more files are open. Refer to the next page for more information of this function. |
|  | Custom Split | Customs division of displayed image size and display images are displayed side by side. It can be selected when two or more files are open. Refer to the next page for more information of this function. |
|  | Floating | Displays images in floating window. You can specify the arrangement the same as Custom Split. |
|  | Release the Split | Releases the split of the file images. |

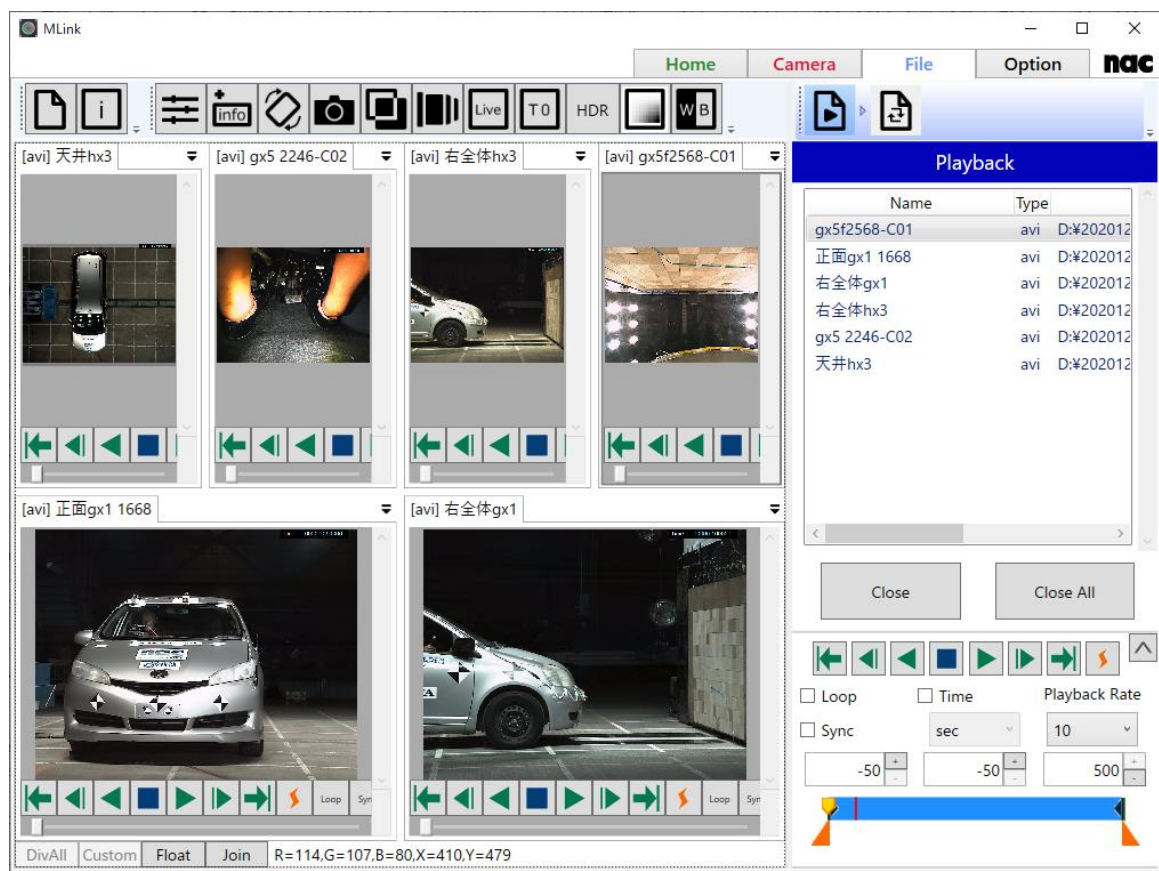
Click on “Custom” button to customize the layout of images. The following window will be displayed.



To customize the layout, check the “Enable to custom layout” checkbox, enter the number of Rows and Columns, and then click “OK”.

Make sure that the product of rows and columns is less than or equal to 16. If not, warning window will be displayed, and the settings will not be reflected.

Recent settings are saved and will be used by clicking on “DivAll” button.



(Example) Images:6 Rows:2 Columns:4

Images are placed from the top row. In case elements of last row is lower than the specified columns, images are laid out like above figure.

If you click **OK** button when **Enable to custom layout** is unchecked, images are automatically laid out in three columns.

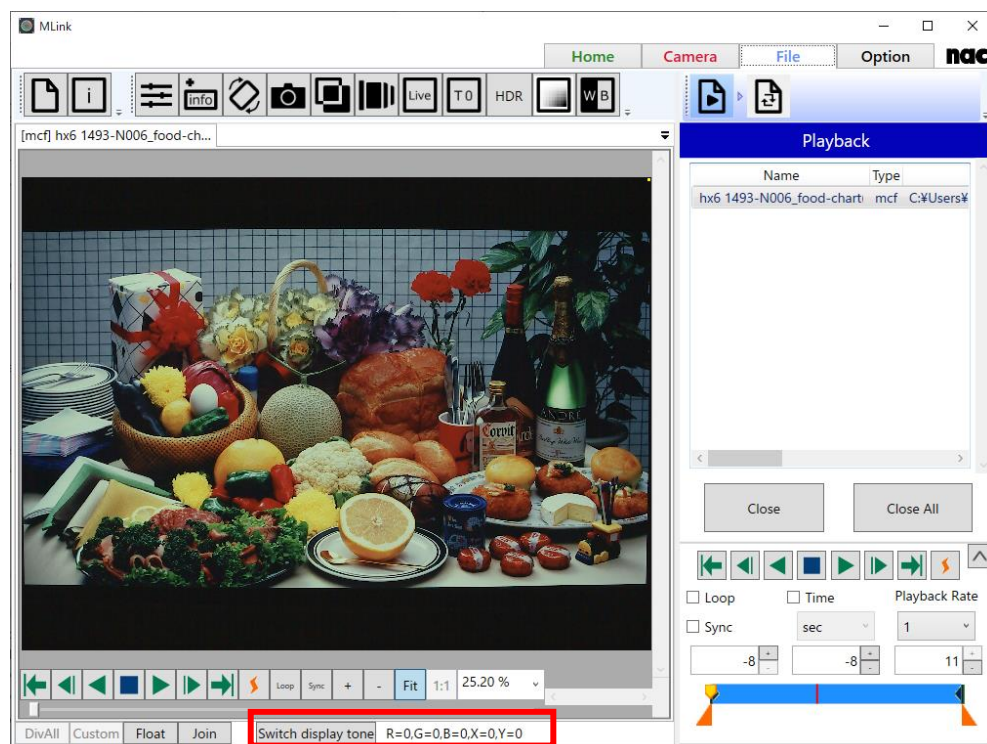
If **Arrange video and waveform files** is checked, movie files and waveform files are arranged so that they are suitable for the Combined Conversion. For more information of the Combined Conversion, refer to **p.251**. You can select the alignment from horizontal or vertical. When horizontal is selected, movie files are placed to the left-half area, and waveform files are placed to the right-half area. When vertical is selected, movie files are placed to the top-half area, and waveform files are placed to the bottom-half area.

The **Arrange waveform files** checkbox becomes selectable when **Arrange video and waveform files** is checked. If **Arrange waveform files** is unchecked, the waveform area displays one waveform file. If **Arrange waveform files** is checked, the waveform area is divided to the number of waveform files to display them. You can select the alignment from horizontal or vertical.

4.5.6 Switch display tone

You can switch the display of pixel values between 8-bit RGB values and luminance values with the Switch display tone button.

The luminance value display is useful to check if saturation is occurring in the image.



The luminance value shows the value equivalent to the images converted to TIFF16(monochrome 16bit). The value scale is 12-bit if the MCFF was recorded with the pixel bit depth of 12, and the scale is 10-bit if the MCFF was recorded with the pixel bit depth of 8 or 10.

4.6 Customize

The settings panel can show only the required items.

4.6.1 Settings Panel

The settings panel is used as follows.

- Hide unused settings
- Display detailed settings

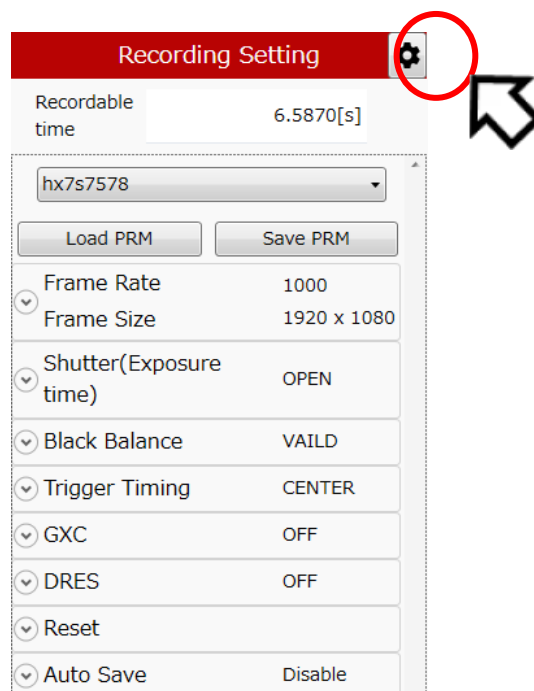
Customized settings are applied even after the next startup.

Hide unused settings

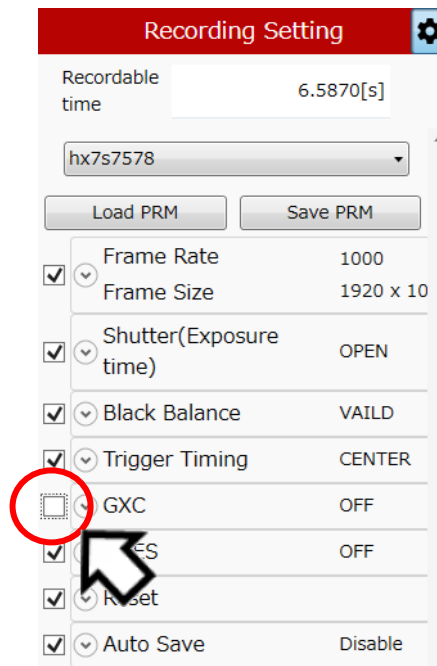
You can customize the panel to hide settings you use less often.


The settings are made according to the following procedure.

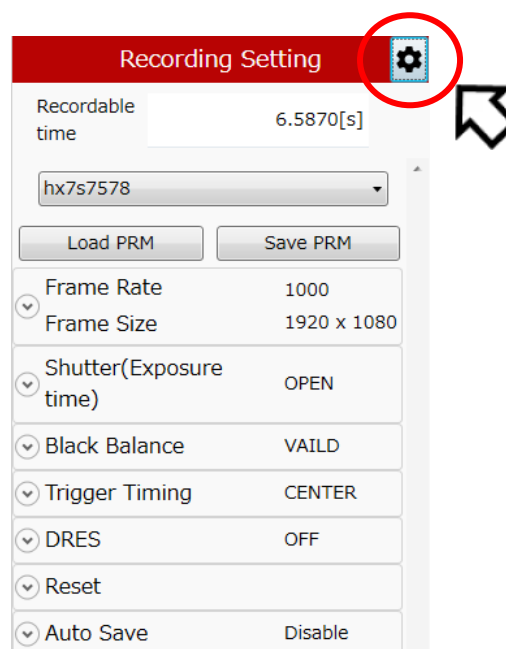
1) Click .




- 2) The settings panel is in the customize mode, and a checkbox is shown on the left side of each setting so remove the check for a setting not to be shown.




- 3) Click  again to return the settings panel to the normal mode and only the checked items will be shown.

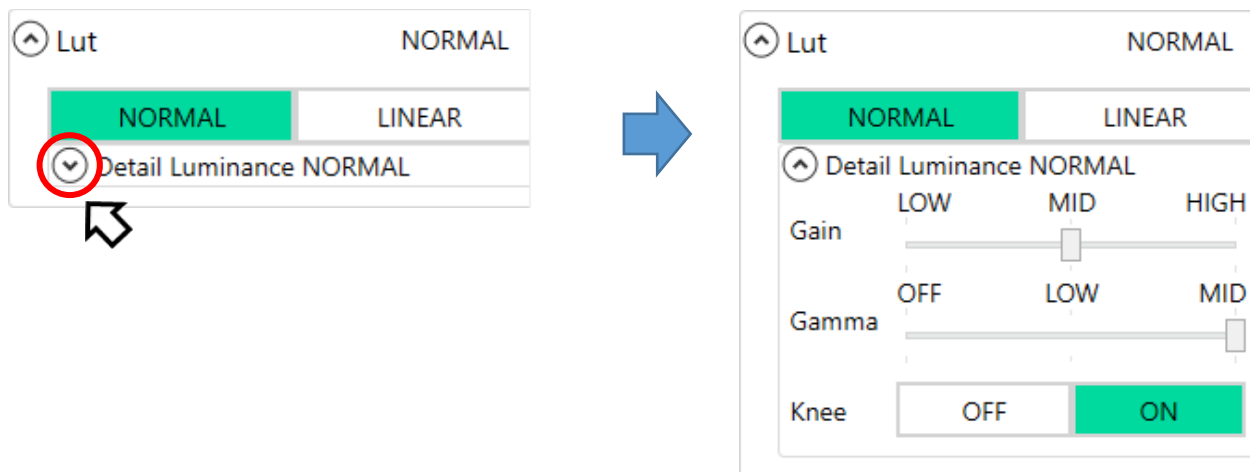



Display detailed settings


Click  to display the detailed settings.

Next is a description using “Luminance Properties” as an example.

Click  on the left side of the luminance properties to show the expanded functions of the luminance properties.



 : Indicates that the detailed settings are not displayed. Click to show the detailed settings.

 : Indicates that the detailed settings are displayed. Click to not show the detailed settings.

5

System Settings

(HXUtility)

(Blank Page)

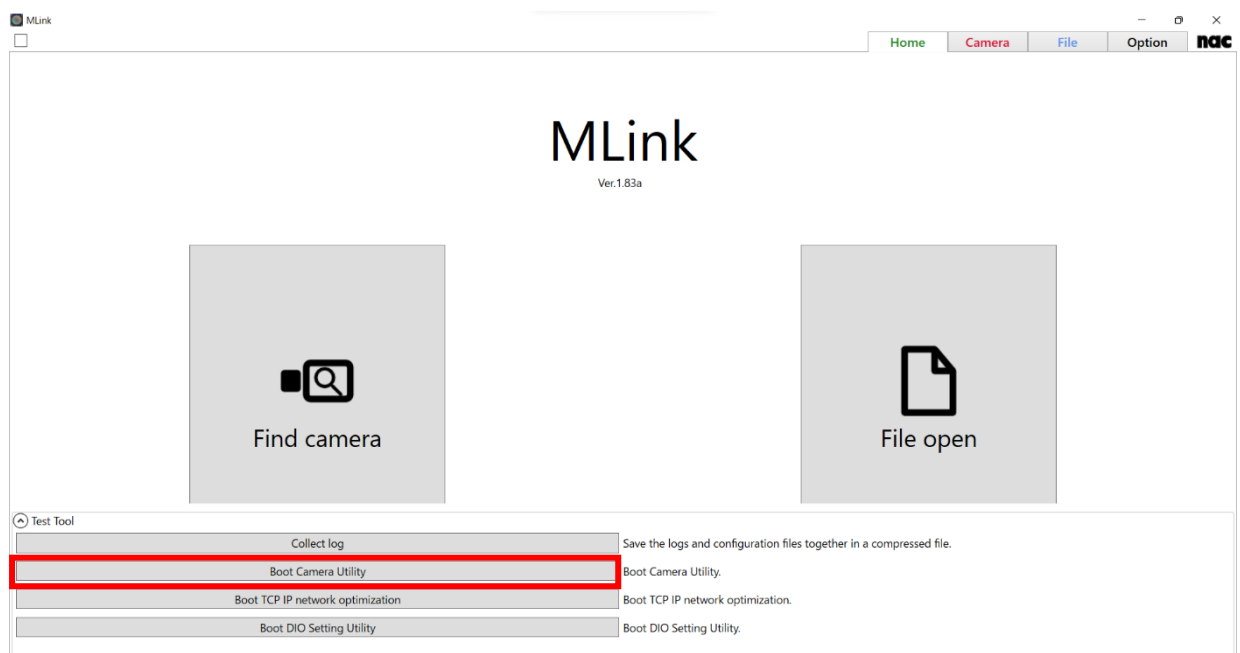
5 System Settings (HXUtility)

5.1 HXUtility Details, Startup Process

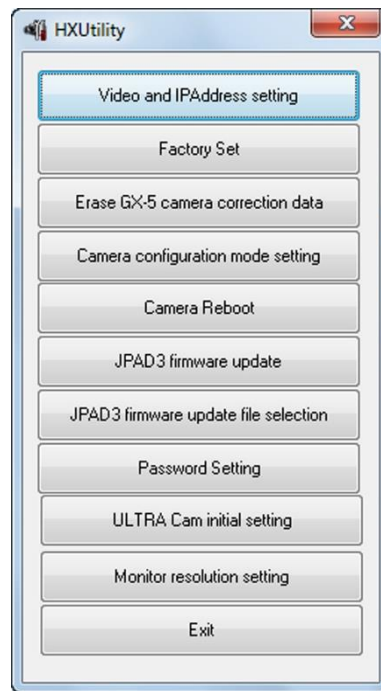
The HXUtility is a tool to perform the following on HX, GX, Q, ACS and GO cameras.

- Change camera IP address
- Camera factory settings
- Erase GX-5 camera correction data
- Change GX-5 camera configuration mode
- Reboot camera
- Switch camera video display method (NTSC / PAL)
- Update version of remote control (J-PAD3) firmware
- ULTRA Cam initial settings (ULTRA Cam only tool)
- Monitor resolution settings (HX camera only tool)

Also, passwords can be set to prevent settings due to erroneous operation of the HXUtility.



To start HXUtility, click the "Boot Camera Utility" button from "Test Tool" on the Home tab.



HXUtility launch screen

5.2 Video Format and IP Address Settings

Sets the HX, GX, Q, MX, ACS and GO camera IP address and GX camera video format (NTSC / PAL).

HX cameras automatically obtain the IP address. If there is a DHCP server on the LAN connected to a camera, the camera IP address can be automatically obtained from the DHCP server.

The contents changed are enabled after power to the camera is disconnected.

Change the settings with the following procedures.



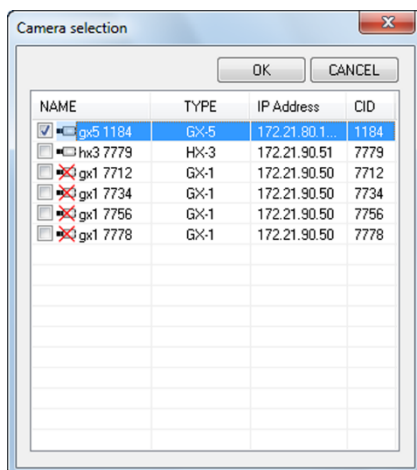
Caution

If Q camera before Ver1.18 reboot, IP address return to factory value.



Confirm that the HX, GX, MX, ACS and GO cameras with the settings have started up and the PC and cameras have connected to the network. Additionally, confirm that the camera is not in use.

Startup the HXUtility and click "Video Format and IP Address Settings".



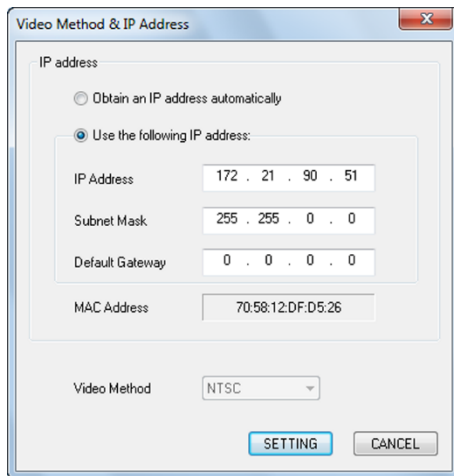
The "Select Camera" dialogue is displayed with a list of cameras currently connected to the network.

An "x" is shown on the camera icon of the camera which can't be connected. (In use, or the IP address of Q camera is not on the network segment of PC)

Even when the IP addresses of a Q camera is not on the network segment of a PC, the IP address of a Q camera can be changed.

Check a camera to set and click "OK".

■ HX, MX, ACS, GO Cameras



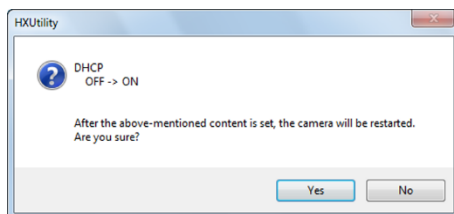
The "Video Format and IP Address Settings" dialogue is shown with the current camera settings.

"Automatically Obtain IP Address" Automatically obtain the IP address from the DHCP server on the LAN.

"Use the Following IP Address"

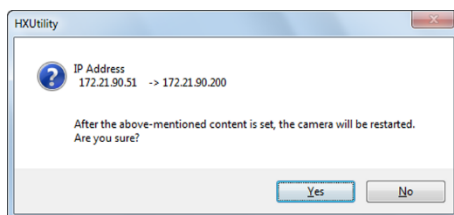
Specify the item to be set (IP address / subnet mask / default gateway).

Click "Set" when finished setting.



The confirmation dialogue shown in the figure appears when setting "Automatically Obtain the IP Address".

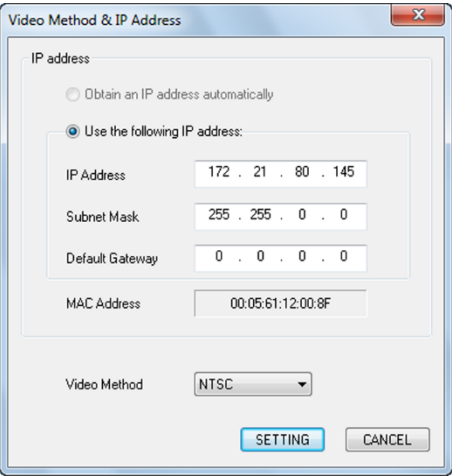
Click "Yes" to change the camera settings and restart the camera.



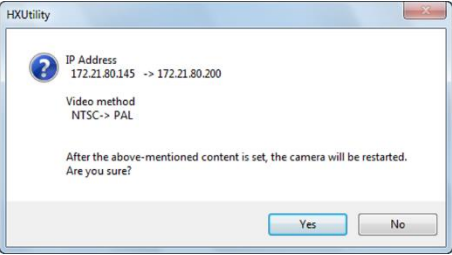
The confirmation dialogue shown in the figure appears when setting "Use the Following IP Address".

Click "Yes" to change the camera settings and restart the camera.

■ GX Cameras

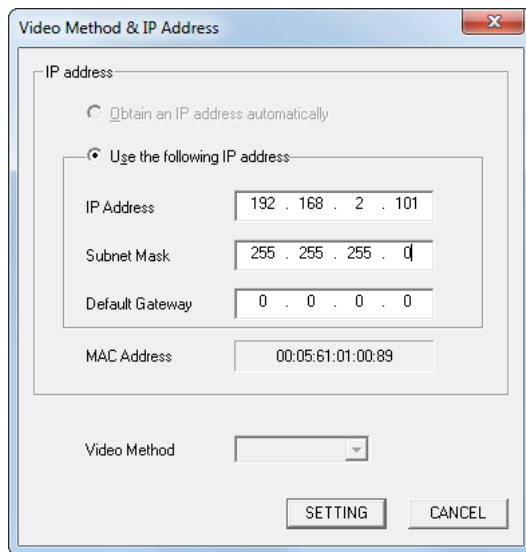


The confirmation dialogue shown in the figure appears when setting "Use the Following IP Address".
Click "Yes" to change the camera settings and restart the camera.



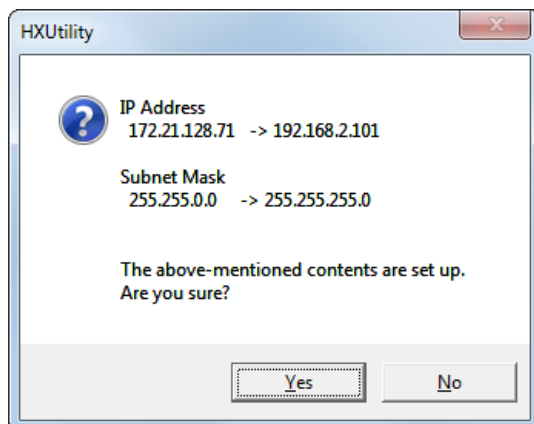
A confirmation dialogue appears. Click " Yes" to change the camera settings and restart the camera.

■ Q Cameras



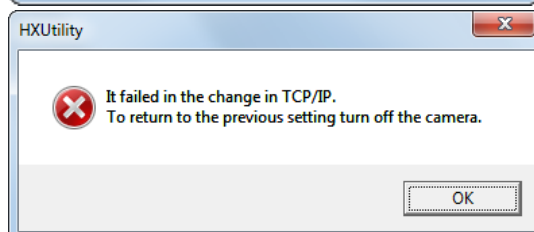
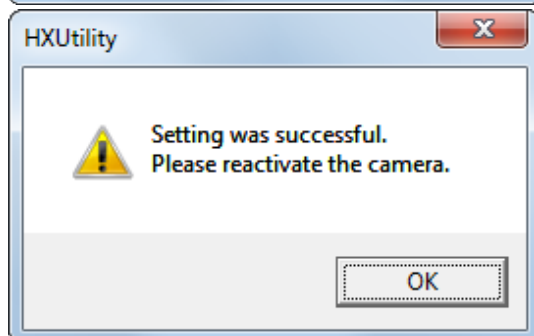
Input IP Address you use in “IP Address” in “Use the following IP address”.

You can change “Subnet Mask” and “Default Gateway”, too.



Confirm the changing of IP Address.

Click “Yes”.



5.3 Camera Factory Settings

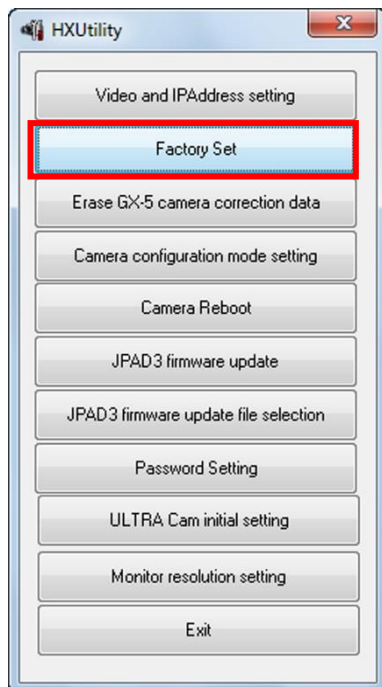
Reverts the HX, GX, Q, MX, ACS and GO cameras to the factory settings.



Caution

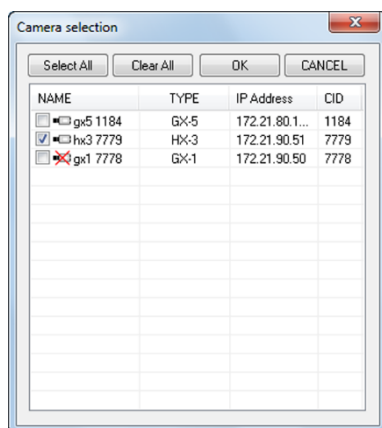
If the factory settings are implemented, the image data recorded in the camera memory is lost. If there is still data that is needed, make sure to download the image data before implementing the factory settings.

Change the settings with the following procedures.



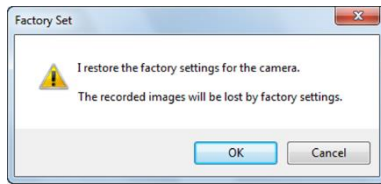
Confirm that the HX and GX cameras with the settings have started up and the PC and cameras have connected to the network. Additionally, confirm that the camera is not in use.

Startup the HXUtility and click "Factory Settings"



The "Select Camera" dialogue is displayed with a list of cameras currently connected to the network.

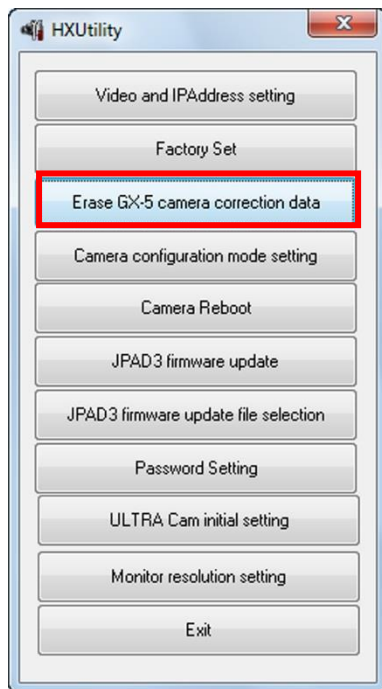
An "x" is shown on the camera icon of the camera which can't be connected. (In use, or the IP address of Q camera is not on the network segment of PC)



A confirmation dialogue appears. Click "Yes" to change to the factory settings and restart the camera.

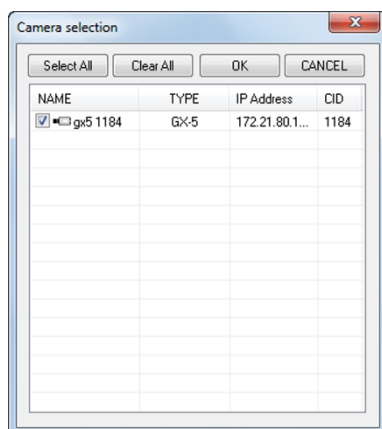
5.4 Erase GX-5 Camera Correction Data

Initializes the non-volatile memory in the GX-5/GX-5F DRP where the camera correction data is saved and erases the camera correction data.



Confirm that the GX-5 cameras with the settings have started up and the PC and cameras have connected to the network. Additionally, confirm that the camera is not in use.

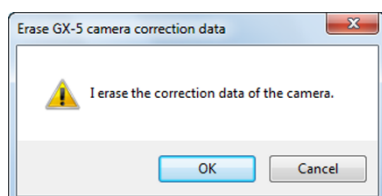
Startup the HXUtility and click "Erase GX-5 Camera Correction Data".



The "Select Camera" dialogue is displayed with the GX-5/GX-5F DRP currently connected to the network.

An "x" is shown on the camera icon for the DRP in use.

Check a camera to set and click "OK".



A confirmation dialogue appears. Click "Yes" to erase the camera correction data and restart the camera.

5.5 GX-5 Camera Configuration Mode Settings

Switches the GX-5 camera configuration mode settings. Select any of the following camera configuration modes.

Set Manually Change the camera configuration settings with the HXLink or the J-PAD3.

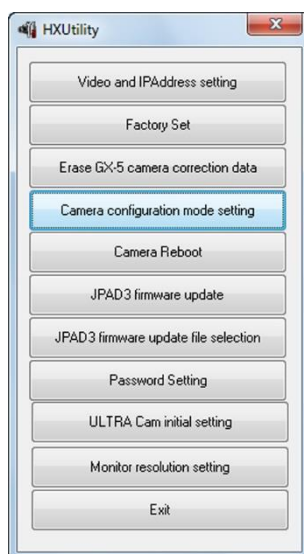
Set Automatically Performed automatically if the camera configuration settings and the configuration of the camera head connected to the GX-5 DRP differ at GX-5/GX-5F DRP.



Caution

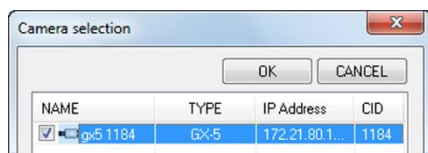
If the camera configuration mode is "Set Automatically", save the recorded data before turning off the DRP power even if there is a backup.

If the camera head cannot be verified at DRP startup due to a malfunction of the camera head contacts or such, the image data performed with the camera configuration settings will be lost.



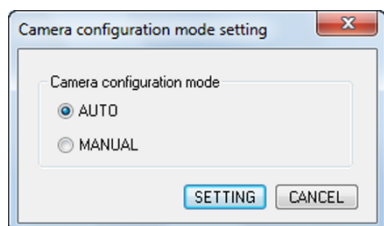
Confirm that the GX-5/GX-5F cameras with the settings have started up and the PC and cameras have connected to the network. Additionally, confirm that the camera is not in use.

Startup the HX Utility and click "Camera configuration mode setting".

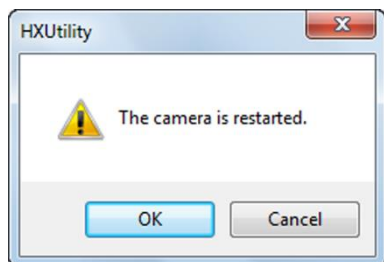


The " Select Camera" dialogue is displayed with a list of the GX-5/GX-5F cameras currently connected to the network.

An "x" is shown on the camera icon for the cameras in use.



The "Camera Configuration Mode Settings" dialogue appears. Select the camera configuration mode.

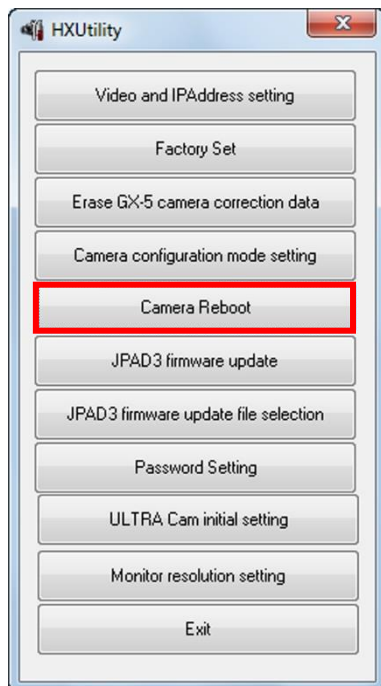


A confirmation dialogue appears when the camera configuration mode is changed. Click "Yes" to change the camera configuration data and restart the GX-5/GX-5F DRP.

5.6 Reboot Camera

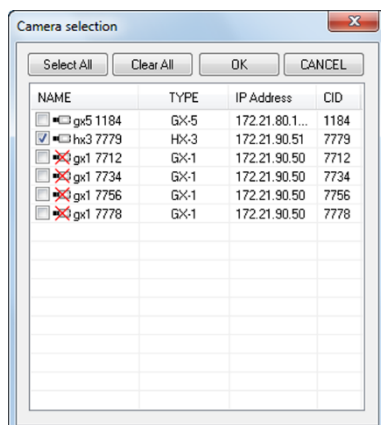
Reboots the HX, GX, MX, ACS and GO cameras.

Change the settings with the following procedures.



Confirm that cameras with the settings have started up and the PC and cameras have connected to the network.

Additionally, confirm that the camera is not in use.



The "Select Camera" dialogue is displayed with the cameras currently connected to the network.

An "x" is shown on the camera icon for the cameras in use.

Check a camera to set and click "OK".



A confirmation dialogue appears. Click "Yes" to reboot the camera.

5.7 Update J-PAD3 Firmware

Updates the firmware for the remote control (J-PAD3) connected to the GX camera.

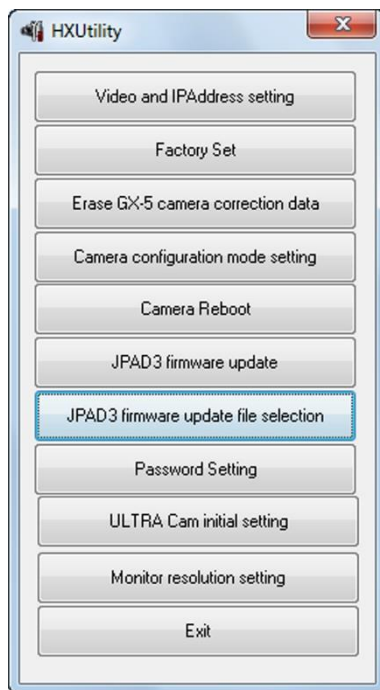


Caution

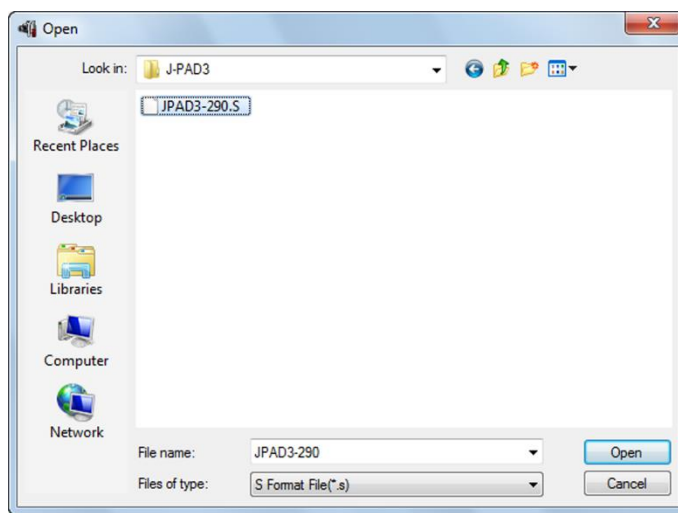
Make sure to turn off the camera power and unplug the J-PAD3 from the GX camera when updating J-PAD3 firmware.

If not properly updated, the J-PAD3 will not startup and cannot be used.

First, select the firmware file according to the following procedure.

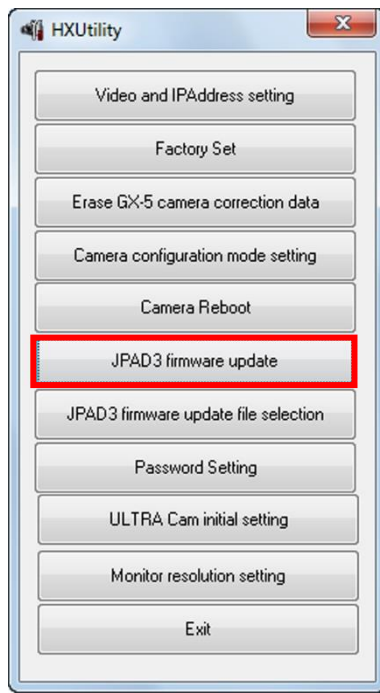


Startup the HXUtility and click "Select JPAD3 Firmware Update File".



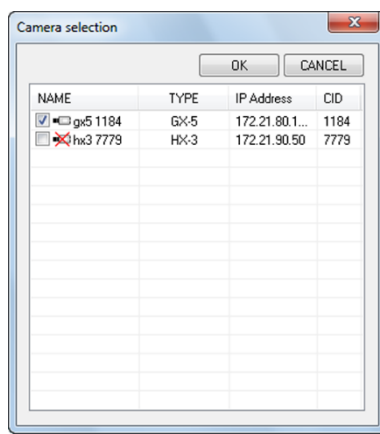
The "Open File" dialogue is displayed, so specify the firmware file and click "Open".

Next, update the firmware with the following procedure.



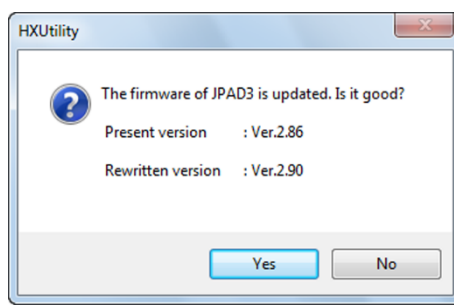
Confirm that the GX cameras with the settings have started up and the PC and cameras have connected to the network. Additionally, confirm that the camera is not in use and the J-PAD3 is connected to the camera.

Startup the HXUtility and click "Update JPAD3 Firmware".



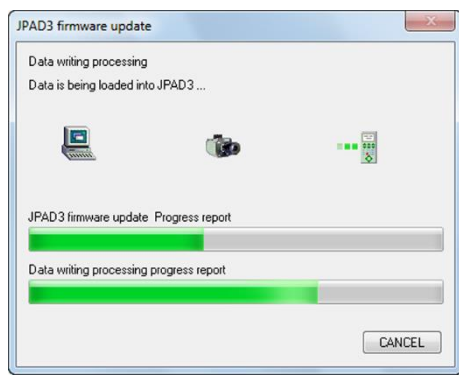
The "Select Camera" dialogue is displayed with a list of the cameras currently connected to the network. An "x" is shown on the camera icon for the cameras in use.

Check a camera to update the J-PAD3 firmware and click "OK".

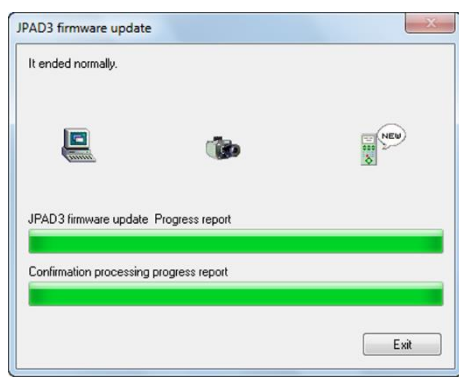


A confirmation dialogue appears. Click "Yes" to start updating the J-PAD3 firmware connected to the camera.

Then do not operate until "Completed Normally" appears.



The "Update JPAD3 Firmware" dialogue appears and the firmware writing progress is shown on the progress bar.



Once the J-PAD3 firmware update is done, "Completed Normally" appears.

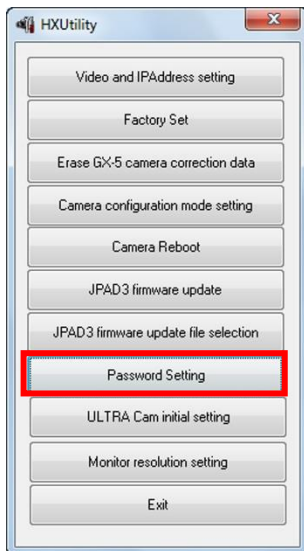
Click "Exit".

5.8 Set Password

Set a password on the HXUtility to prevent changes to the camera settings due to erroneous operation.

Passwords cannot be set during initialization.

Set/change the password with the following procedures.



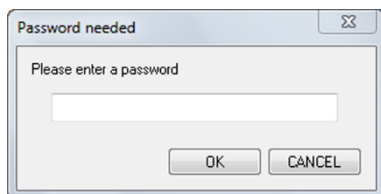
Startup the HXUtility and click "Set Password".



The "Set Password" dialogue is displayed.

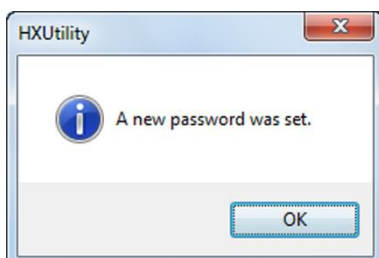
If a password is already set, input the current password in "Enter Current Password".

Enter the new password in "Enter New Password" and "Enter New Password Again".



A message appears indicating the setting was completed.

Click "OK".



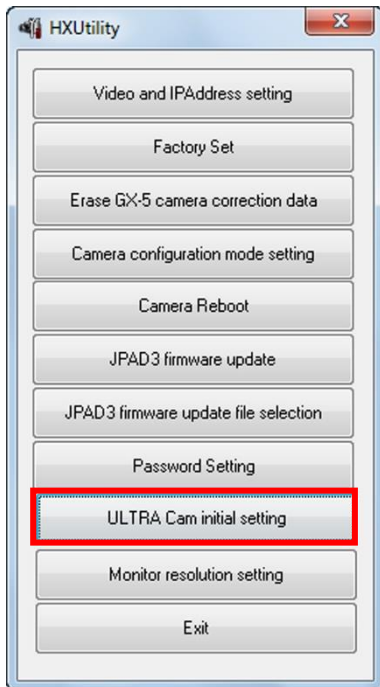
A message appears indicating the setting was completed.

Click "OK".

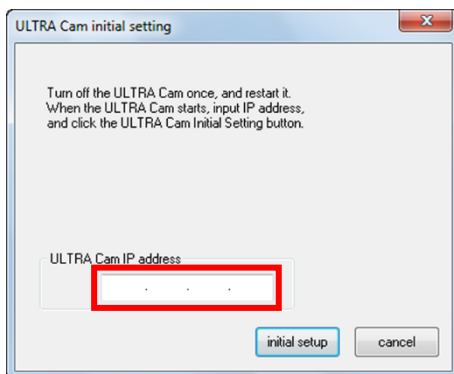
5.9 ULTRA Cam Initial Settings

Retrieves the ULTRA Cam RGB gain adjustment value and calculates the RGB gain value for the camera color temperature W/B setting to be saved in the individual camera settings file.

Initialize the W/B set RGB gain value with the following procedures.



Startup the HXUtility and click "ULTRA Cam Initial Settings".



The "ULTRA Cam Initial Settings" dialogue is displayed.

Enter the IP address of the camera to be set and click "Initial Settings".

The setting completed message appears. Click "OK".

5.10 HX Camera Monitor Resolution Settings

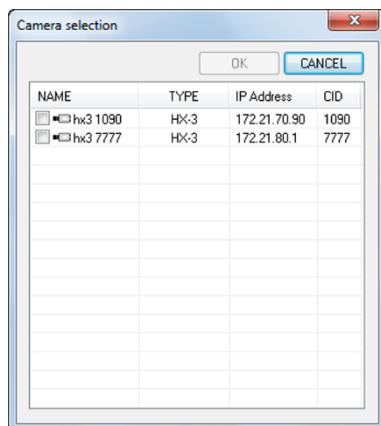
Sets the monitor resolution for the HX camera connected.



Confirm that the HX cameras with the settings have started up and the PC and cameras have connected to the network.

Additionally, confirm that the camera is not in use.

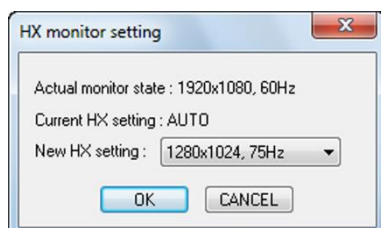
Startup the HXUtility and click "Monitor Resolution Settings".



The "Select Camera" dialogue is displayed with a list of cameras currently connected to the network.

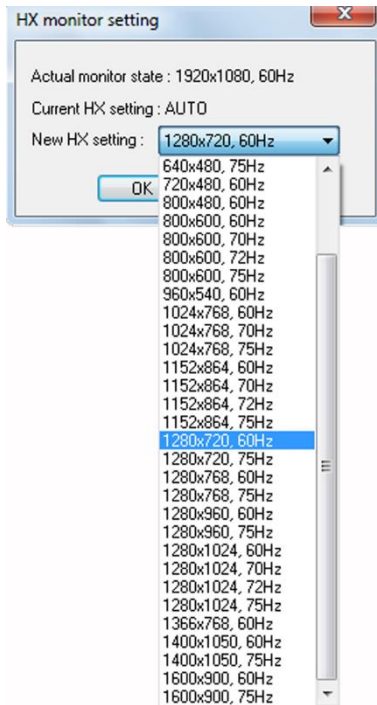
An "x" is shown on the camera icon for the cameras in use.

Check a camera to set and click "OK".

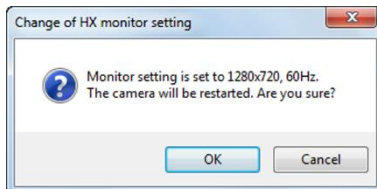
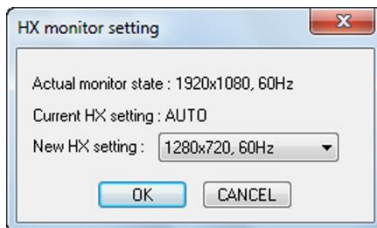


The monitor resolutions that can be used are shown in the pull-down menu under "New Settings" in the "HX Monitor Settings" window. If AUTO is selected, the maximum resolution that can be used for the monitor connected to the HX camera is set.

~System Settings (HXUtility)~



The monitor resolutions that can be used are shown in the pull-down menu under "New Settings" in the "HX Monitor Settings" window. If AUTO is selected, the maximum resolution that can be used for the monitor connected to the HX camera is set.



Click "OK" to and the window confirming camera reboot to change the monitor settings appears.

Click "OK" in the confirmation window to reboot the camera and change the monitor resolution.

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6

Specifications

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6 Specifications

6.1 Operating Environment

The PC conditions to operate the MLink are as follows.

Single Camera Control

| | |
|----------|---|
| OS | Windows 10 Pro (32 / 64bit) Windows 11 Pro .NET Framework 4.7.1 or later |
| Memory | 4GB or more 【recommend 8GB or more】 |
| CPU | Intel Core i5 【recommend Intel Core i7 or higher】 |
| Display | Full color, screen size of 1024×768 or higher, screen DPI settings of 96dpi 【recommend 1920 x 1080 or higher】 (If the camera image size is 1280×1024, 1600×1200 or higher is recommended) |
| Storage | 2GB or more for program and log 250GB or more for data (recommend 2TB or more) (depending on the number of cameras, number of frames saved) |
| Network | Gigabit Ethernet (LAN cable that is a category 5e or higher) |
| CD drive | 1 (for installation) |

Multi-Camera Control

| | |
|----------|---|
| OS | Windows 10 Pro (32 / 64bit) Windows 11 Pro 【64bit recommended. There are memory limitations with the 32bit】 .NET Framework 4.7.1 or later |
| Memory | 8GB or more 【recommend 16GB or more】 |
| CPU | Intel Core i5 【recommend Intel Core i7 or higher】 |
| Display | Full color, screen size of 1024×768 or higher, screen DPI settings of 96dpi 【recommend 1920 x 1080 or higher】 (If the camera image size is 1280×1024, 1600×1200 or higher is recommended) |
| Storage | 2GB or more for program and log 250GB or more for data (recommend 2TB or more) (depending on the number of cameras, number of frames saved) |
| Network | Gigabit Ethernet (LAN cable that is a category 5e or higher) |
| CD drive | 1 (for installation) |

Compression and the display processing speeds depend greatly on the CPU performance. Free space for data on the disc requires space sufficient for the operations.

With the 32-bit version of MLink, there is an upper limit on the number of cameras connected and the number of MCFFs that can be opened due to Windows OS memory usage limit. Stable operation is possible if the used memory of MLink 32 bit version is within 1 GB.

Estimated used memory is as follows.

Q camera 1 unit : 250 MB, Q camera MCFF 1 file : 250 MB

"Memory usage exceeds 1 GB" is displayed in the warning window when the used memory becomes 1 GB or more. If the file can not be opened due to insufficient memory, a message "[File name] One or more errors occurred [Time]" appears in the warning window.

There may be times when this product may not function properly due to the computer configuration and version for reasons other than the above conditions.

6.2 Compatible Cameras

Cameras compatible with MLink are as follows.

- MEMRECAM GX series

GX-1, GX-1F, GX-1z, GX-1Fz, GX-3, GX-3z, GX-8, GX-8F, GX-8z, GX-8Fz

GX-5 (P-Cam, P2-Cam, S-Cam, S2-Cam, HR-Cam, C-Cam, μ -Cam) ,

GX-5F (P-Cam, P2-Cam, S-Cam, S2-Cam, HR-Cam, C-Cam, μ -Cam)

With MLink, P-Cam, P2-Cam, S-Cam, S2-Cam, C-Cam, μ -Cam are all called P-CAM.

Only the HR-Cam is called HR -CAM.

- MEMRECAM HX series

HX-1, HX-3, HX-4, HX-5, HX-6, HX-7, HX-7S

- MEMRECAM Q series

Q1m, Q1v, Q2m, Q5 (P-Cam, P2-Cam, S-Cam, S2-Cam, C-Cam, μ -Cam)

- MEMRECAM MX series

MX-5 (M-Cam, M-CamMFT, M2-Cam, M3-Cam, μ -Cam)

- MEMRECAM ACS series

ACS-1, ACS-3, ACS-1 M60, ACS-1 M40, ACS-1 M30, ACS-3 M16

- MEMRECAM GO series

GO-9, GO-12, GO-4K

6.3 Compatible File Formats

File formats that can be played back with this software include the following.

| | | |
|--------------------------|------|--------------------|
| MCFF | .mcf | MCFF |
| AVI | .avi | Color 24bit AVI |
| AVI (H264) | .avi | H.264 AVI |
| MP4 | .mp4 | MPEG4 AVC/H.264 |
| TIFF (Monochrome 8bit) | .tif | B/W 8bit TIFF |
| TIFF (24bit) | .tif | Color 24bit TIFF |
| Bitmap (Monochrome 8bit) | .bmp | B/W 8bit bitmap |
| Bitmap (24bit) | .bmp | Color 24bit bitmap |
| JPEG | .jpg | Color 24bit JPEG |
| PNG | .png | Color 24bit PNG |

File formats that can be convert the format with this software include the following.

| | | |
|---------------------------|------|--------------------|
| AVI | .avi | Color 24bit AVI |
| AVI (Monochrome 8bit) | .avi | B/W 8bit AVI |
| AVI (H264) | .avi | H.264 AVI |
| MP4 | .mp4 | MPEG4 AVC/H.264 |
| TIFF (Monochrome 8bit) | .tif | B/W 8bit TIFF |
| TIFF (24bit) | .tif | Color 24bit TIFF |
| Bitmap (Monochrome 8bit) | .bmp | B/W 8bit bitmap |
| Bitmap (24bit) | .bmp | Color 24bit bitmap |
| JPEG | .jpg | Color 24bit JPEG |
| TIFF48 (48bit) | .tif | Color 48bit TIFF |
| TIFF16 (Monochrome 16bit) | .tif | B/W 16bit TIFF |
| TIFF16 (RAW) | .tif | B/W 16bit TIFF |

Appendix A

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Appendix A

Table of Functions

The functions that can be used with HXLink and the functions expected to be compatible with Ver. 1.86a of MLink are shown in the following table.

Key ○ : Compatible
 — : Not compatible

| Function | Details of Function | HXLink Ver.1.995e | MLink Ver.1.86a |
|-----------------------------------|-----------------------|----------------------|--------------------|
| Compatible Cameras | GX, HX, Qcam, GX5, Q5 | ○ | ○ |
| | MX- 5 , ACS, GO | — | ○ |
| Recording Settings | BB Update | ○ | ○ |
| | EST BB Settings | ○ | ○ |
| | Sensor Gain | ○ | — |
| | GXC | ○ | ○ |
| | Stop Fan | ○ | ○ |
| Set/Display Camera Information | ID, Nickname | ○ | ○ |
| Frame Size Settings | Preset | ○ | ○ |
| | Custom | ○ | ○ |
| | Location · Size | ○ | ○ |
| | Boost Mode | — | ○ |
| Pixel Bit Length | | ○ | ○ |
| Shutter | | ○ | ○ |
| Black Balance | | ○ | ○ |
| Automatic Black Balance | | ○ | ○ |
| Trigger Input Selection | | ○ | ○ |
| Trigger Timing | | ○ | ○ |
| Custom Trigger | | ○ | ○ |
| Exposure Timing | | ○ | ○ |
| Exposure Phase | | ○ | — |
| Variable Speed Recording | | ○ | ○ |
| AE Control | | ○ | ○ |

| Function | Details of Function | HXLink Ver.1.995e | MLink Ver.1.86a |
|-----------------------|-----------------------|----------------------|--------------------|
| AOI | Preset | ○ | ○ |
| | Custom | ○ | ○ |
| DRES Mode | Preset | ○ | ○ |
| | Custom | ○ | — |
| Image Trigger | Preset | ○ | ○ |
| | Custom | ○ | ○ |
| Frame Straddling | Film | ○ | ○ |
| | Display | ○ | ○ |
| Trigger Reset | | ○ | ○ |
| Memory Segmenting | Actual Size | ○ | ○ |
| | Custom | ○ | — |
| | Segment Hold, Protect | ○ | ○ |
| Memory clear | | — | ○ |
| Record Trigger Mode | NORMAL | ○ | ○ |
| | EVENT | ○ | ○ |
| | BURST | ○ | ○ |
| | MULTI | ○ | ○ |
| | MULTIS | ○ | ○ |
| | MULTI1 | ○ | ○ |
| | MULTI2 | ○ | ○ |
| | MULTI3 | ○ | ○ |
| | Linear Recording | ○ | ○ |
| | DUAL Recording | ○ | — |
| Auto View | | ○ | — |
| Low Light | | ○ | ○ |
| Luminance Properties | NORMAL | ○ | ○ |
| | LINEAR | ○ | ○ |
| | CUSTOM | ○ | ○ |
| | TABLE | ○ | ○ |
| Zoom/Scroll (Camera) | | ○ | ○ |
| Camera Video Rotation | | ○ | ○ |

| Function | Details of Function | HXLink Ver.1.995e | MLink Ver.1.86a |
|---|------------------------------|----------------------|--------------------|
| Composite Display | | ○ | ○ |
| Save Image | Individual Download | ○ | ○ |
| | Batch Download | ○ | ○ |
| | AVI Download | ○ | ○ |
| | DOWNLOAD REC | ○ | ○ |
| | Simultaneous Download | ○ | ○ |
| | HD-mag Save | ○ | — |
| | USB Save Image | ○ | ○ |
| | Split Save MCFF | ○ | — |
| | Auto Download | ○ | ○ |
| | Auto Format Conversion | ○ | ○ |
| | Auto Camera Control | ○ | — |
| | Show Record Status | ○ | — |
| SnapShot | | ○ | ○ |
| Playback File Image | | ○ | ○ |
| T=0 Setting | | ○ | ○ |
| Frame Number Setting | | ○ | — |
| Image Quality Settings for Camera Image File | Gain | ○ | ○ |
| | White Balance | ○ | ○ |
| | Gamma | ○ | ○ |
| | Chroma | ○ | ○ |
| | Knee | ○ | ○ |
| | Low Pass Filter | ○ | ○ |
| | Luminance Properties | ○ | ○ |
| | Luminance Adjustment | ○ | ○ |
| | Input Black Level Adjustment | ○ | ○ |
| | RGB Matrix Correction | ○ | ○ |
| | Reset | ○ | ○ |
| Custom White Balance | | ○ | ○ |
| Auto White Balance | | ○ | ○ |

| Function | Details of Function | HXLink Ver.1.995e | MLink Ver.1.86a |
|-----------------------------------|--------------------------|----------------------|--------------------|
| Auto Conversion Settings | | ○ | ○ |
| Conversion Settings File (FCV) | | ○ | ○ |
| Superimpose Information | | ○ | ○ |
| Superimpose Image | | ○ | ○ |
| Trimming | | ○ | ○ |
| Format Conversion | | ○ | ○ |
| Frame Rate Conversion | | ○ | — |
| Wave Data | | ○ | ○ |
| Synchronization Settings | Camera Time | ○ | ○ |
| | Camera Synchronization | ○ | ○ |
| | EST View Synchronization | ○ | ○ |
| Camera Frame Time | Trigger Time | ○ | ○ |
| | Exposure Time | ○ | ○ |
| | Time Stamp ON/OFF | ○ | ○ |
| Input/Output Signals | EPO Polarity | ○ | ○ |
| | FAULT Status Output | ○ | ○ |
| | Trigger Input Selection | ○ | ○ |
| | TRIG1 Polarity | ○ | ○ |
| | TRIG2 Polarity | ○ | ○ |
| | TRIG1 Filter | ○ | ○ |
| | TRIG2 Filter | ○ | ○ |

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| | | | |
|--|--|---|---|
| | Combine TRIG2 Filter with the TRIG1 Filter | ○ | ○ |
| | Trigger Edge Detection | ○ | ○ |
| | G Trigger | ○ | ○ |
| | G Trigger Threshold | ○ | ○ |
| | TRIG Output Mode | ○ | — |
| | TRIG Output Polarity | ○ | ○ |
| | ARM Status Output Polarity | ○ | ○ |
| | ARM Command Input Polarity | ○ | ○ |

| Function | Details of Function | HXLink Ver.1.995e | MLink Ver.1.86a |
|----------------------|--|----------------------|--------------------|
| Input/Output Signals | EST Input Selection | ○ | ○ |
| | EST1 Input Polarity | ○ | ○ |
| | EST2 Input Polarity | ○ | ○ |
| | EST1 Filter | ○ | ○ |
| | EST2 Filter | ○ | ○ |
| | Combine EST2 Filter with the EST1 Filter | ○ | ○ |
| | Settings at Shipment | ○ | ○ |
| | Record to User Settings | ○ | ○ |
| | Load User Settings | ○ | ○ |
| HX/GX Video Display | Video OSD | ○ | ○ |

| | | | |
|----------|--|---|---|
| | OSD Display Mode | ○ | ○ |
| | Frame Time Display Format | ○ | ○ |
| | Standard Frame Relative Time | ○ | ○ |
| | DATE/TIME Display while Photographing | ○ | — |
| | Image Center Mark Settings | ○ | ○ |
| Warnings | Frame Rate | ○ | ○ |
| | IRQ | ○ | ○ |
| | Battery Remaining Warning | ○ | ○ |
| | RTC Low Battery Warning | ○ | ○ |
| | Inconsistent Black Balance Date | ○ | ○ |
| | Sounds when Warning | ○ | — |
| | Open Warning Window during Warning | ○ | ○ |
| View | View | ○ | ○ |
| | Live Image ON/OFF | ○ | — |
| | Invert • Rotate | ○ | ○ |
| | Live Method High Speed/Standard | ○ | ○ |
| | Monitor Output | ○ | ○ |
| | Full Resolution Display Method YC/MCFF | ○ | ○ |

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| Function | Details of Function | HXLink Ver.1.995e | MLink Ver.1.86a |
|-----------------------------------|---------------------|----------------------|--------------------|
| EF Lens Control | | ○ | ○ |
| MFT Lens Control | | — | ○ |
| Save Project | | ○ | — |
| LAA | | ○ | — |
| Qcam Transfer Speed Adjustment | | ○ | — |
| MLink Mobile | | — | ○ |

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Appendix B

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Appendix B

Recording / download setting file (INI file)

The recording / download setting file (INI) is a file that describes setting parameters for recording / downloading. The contents are as stated below.

| Section name | Key name | Setting value |
|--------------|-----------------|--|
| PARAM | | |
| | CAMCOUNT | Number of cameras (number of recording condition sections) |
| REC_PARAM{0} | | The recording condition section {0} is a sequential number starting from 0 |
| | NICKNAME | Nickname |
| | PORTNO | Port number (Multi-camera head only) |
| | FRAME_RATE_STR | Frame rate |
| | FRAME_SIZE_STR | Frame size (Example: 1280x960) |
| | PIXEL_BIT_DEPTH | Pixel bit depth (8 / 10 / 12) |
| | TRIGGER | Trigger timing (START / CENTER / END / CUSTOM) |
| | TRIGGER_VAL | Custom trigger value |
| | SHUTTER | Shutter (OPEN / 1k / ... / Exposure time in μ seconds (Example: 300.0us)) |
| | WB | White balance (AUTO / REG / 3100k / 5000k / 9000k) |
| | GAIN | Gain (LOW / NORMAL / HIGH) |
| | GAMMA | Gamma (OFF / LOW / NORMAL) |
| | ENHANCE | Enhance (OFF / LOW / MID / HIGH) MID can also be NORMAL |
| | CHROMA | Chroma (0 / 50 / 100 / 150 / 200) |

| | | |
|--|-------------|--|
| | KNEE | Knee (OFF / ON) |
| | USERDISTSEL | Index of preset of lens distortion correction. |

| Section name | Key name | Setting value |
|--------------|-------------|--|
| DL_PARAM{0} | | Download condition section {0} is the recording condition section number of the corresponding camera |
| | BEGIN_FRAME | Download start frame |
| | END_FRAME | Download end frame |
| | FILE_TYPE | Download file type 0: AVI 1: JPEG Sequence 2: MCF 3: BMP (24bit) Or avi: AVI jpg: JPEG Sequence bmp: BMP (24bit) |
| | FILE_NAME | Download file name |
| | FILE_PATH | Download file path |

Conversion Settings File (FCV Files)

FCV is a file to describe setting parameters of format conversion.

If the size of the AVI codec configuration parameter is 512 characters or more, the parameter is saved in a Codec Configuration File (CSDT file) created in the same folder as the FCV, and the file path of that CSDT file is saved in the COMP_STATE_EX key of the FCV.

The contents of the conversion settings files is as follows.

- Conversion range settings

| Key | Description |
|--------------|--|
| SEG_SEL | Segment number to convert. Always 0 for MEMRECAM ci series. |
| BEGIN_FRAME | Frame number of the beginning of the conversion range. This key is for files that contain single recording block. |
| END_FRAME | Frame number of the end of the conversion range. This key is for files that contain single recording block. The file will not be converted if either BEGIN_FRAME or END_FRAME is not in the frame range of the MCFF, or if END_FRAME < BEGIN_FRAME. |
| BEGIN_FRAMEn | Frame number of the beginning of the conversion range for block n. |
| END_FRAMEn | Frame number of the beginning of the conversion range for block n. The n is the block number used for multi-trigger function. The conversion range is the overlap between the range indicated by BEGIN_FRAMEn and END_FRAMEn and the frame range of the MCFF file. If there is no overlap, the block will not be converted. |
| BEGIN_TIME | Time at the beginning of the conversion range in seconds. This key is for files that contain single block. |
| END_TIME | Time at the end of the conversion range in seconds. This key is for files that contain single block. The file will not be converted if either BEGIN_FRAME or END_FRAME is not in the frame range of the MCFF, or if END_FRAME < BEGIN_FRAME. |

| | |
|-------------------------|--|
| BEGIN_TIME _n | Time at the beginning of the conversion range for block n in seconds. |
| END_TIME _n | Time at the end of the conversion range for block n in seconds. The n is the block number used for multi-trigger function. The conversion range is the overlap between the range indicated by BEGIN_TIME _n and END_TIME _n and the frame range of the MCFF file. If there is no overlap, the block will not be converted. |

If the keys of BEGIN_FRAME, END_FRAME, BEGIN_FRAME_n, END_FRAME_n, BEGIN_TIME, END_TIME, BEGIN_TIME_n, END_TIME_n are specified together, the conversion range is determined according to the following order of priority.

1. BEGIN_FRAME_n, END_FRAME_n
2. BEGIN_TIME_n, END_TIME_n
3. BEGIN_FRAME, END_FRAME
4. BEGIN_TIME, END_TIME

The following keys are kept only for compatibility. Use the keys mentioned above.

| | |
|----------|---|
| BEG_TIME | Time at the beginning of the conversion range in seconds. |
| END_TIME | Time at the end of the conversion range in seconds. |

• Superimpose settings

| Key | Description |
|----------|--|
| SI_TYPE | Superimposing type. 0: none 1: frame only 2: all 3: custom If custom is selected, specify items to superimpose with the following keys of SI_ID to SI_DEV_TYPE. |
| SI_ID | Whether to superimpose ID for custom setting. 0: disabled, 1: enabled. |
| SI_SCENE | Whether to superimpose scene for custom setting. 0: disabled, 1: enabled. |

| | |
|------------------|---|
| SI_TRIGGER | Whether to superimpose scene for custom trigger timing. 0: disabled, 1: enabled. |
| SI_TRIGGER_TIME | Whether to superimpose scene for custom trigger time. 0: disabled, 1: enabled. |
| SI_FRAME | Whether to superimpose scene for custom frame time. 0: disabled, 1: enabled. |
| SI_NICKNAME | Whether to superimpose scene for custom camera nickname. 0: disabled, 1: enabled. |
| SI_CID | Whether to superimpose scene for custom CID. 0: disabled, 1: enabled. |
| SI_REC_RATE | Whether to superimpose scene for custom recording speed. 0: disabled, 1: enabled. |
| SI_SHUTTER | Whether to superimpose scene for custom shutter setting. 0: disabled, 1: enabled. |
| SI_DEV_TYPE | Whether to superimpose scene for custom camera type. 0: disabled, 1: enabled. |
| SI_REC_COMMENT | Whether to superimpose scene for recording comment. 0: disabled, 1: enabled. |
| SI_FRAME_TYPE | Format of frame superimposition. 0: Frame number 1: Relative time 2: Absolute time |
| SI_FONTSIZE_TYPE | Font size. 0: Small 1: Medium 2: Large 3: Extra Large |

• Cropping and rotation settings

| Key | Description |
|---------------|---|
| RESIZE_SEL | Resize settings for cropping. 0: 1/1 1: 1/2 |
| CUT_SEL | Crop settings 0: Do not crop 1: Crop to 640x480 (used for previous versions) 2: Crop to the specified size |
| CRECT_X | Offset in X direction from the top left corner of the cropping area to the top left corner of the image. |
| CRECT_Y | Offset in Y direction from the top left corner of the cropping area to the top left corner of the image. |
| CRECT_W | Width of cropping frame |
| CRECT_H | Height of cropping frame |
| CONVERT_ANGLE | Image rotation angle in clockwise. Selectable values: 0, 90, 180, or 270. |
| TB_REVERS | Whether to flip image vertically. 0: disabled, 1: enabled. |
| LE_REVERS | Whether to flip image horizontally. 0: disabled, 1: enabled. |

• Image quality settings

| Key | Description |
|-----------|---|
| GAIN_SEL | Gain settings Selectable values: LOW, NORMAL, HIGH |
| GAMMA_SEL | Gamma setting. -1: disabled, 0: OFF, 2: LOW, 4: NORMAL |
| ENH_SEL | Enhance setting. -1: disabled, 0: OFF, 2: LOW, 4: NORMAL, 6: HIGH |
| KNEE | Knee setting. -1: disabled, 0: OFF, 1: ON |
| LPF_ENB | Low pass filter setting. -1: disabled, 0: OFF, 1: ON |

| | |
|-------------------|--|
| CHROMA | <p>Chroma setting.</p> <p>0: 0%</p> <p>25: 25%</p> <p>50: 50%</p> <p>75: 75%</p> <p>100: 100%</p> <p>150: 150%</p> <p>200: 200%</p> <p>-1: disabled. If selected, CHGAIN_NUM and CHGAIN_DENOM are ignored.</p> |
| CHGAIN_NUM | Numerator for custom chroma value. |
| CHGAIN_DENOM | <p>Denominator for custom chroma value.</p> <p>Saturation for custom chroma is described as: $\text{CHGAIN_NUM} / \text{CHGAIN_DENOM} [\%]$</p> |
| HUE | Hue in degrees. Valid values: -180 to 180, or -9999 to disable it. |
| CONTRAST | Contrast in percents. Valid values: 0 to 6400, or -1 to disable it. |
| BRIGHTNESS | Brightness in percents. Valid values: -100 to 100, or -9999 to disable it. |
| WB_SEL | <p>White balance selection</p> <p>-1: disabled</p> <p>0: custom</p> <p>1: 3100K</p> <p>2: 5000K</p> <p>3: 9000K</p> <p>4: REG</p> <p>5: Auto</p> |
| WB_YRGAIN | R gain value for custom white balance from 0.0 to 8.0. |
| WB_YGGAIN | G gain value for custom white balance from 0.0 to 8.0. |
| WB_YBGAIN | B gain value for custom white balance from 0.0 to 8.0. |
| INPUT_BLACK_LEVEL | Input black level value. |
| RGB_MATRIX | RGB matrix correction. 0: OFF, 1: ON |

| | |
|------------|---|
| FRAME_RATE | Conversion frame rate. |
| LUT_SEL | LUT selection Selectable values: NORMAL, LINEAR, CUSTOM, TABLE |

The following keys are valid only when LUT_SEL is set to CUSTOM.

| | |
|-----------------|--|
| CUSTOMLUT_MIN | Minimum value of input luminance. |
| CUSTOMLUT_MAX | Maximum value of input luminance. |
| CUSTOMLUT_GAMMA | Gamma value for luminance characteristics. |

| Key | Description |
|--------------|--|
| FILE_TYPE | Conversion save file type. Selectable values: avi, mp4, tif, bmp, jpg, mcf |
| CONVERT_TYPE | Conversion method 2: B1 4: D1 6: B2 9: B3 8: D2 10: D3 |
| FCC_HANDLER | FCC of compression method (CODEC) (Used with AVI file conversion) 0: disabled |
| VIDEO_CODEC | Compression method (CODEC) (Used with AVI file conversion) Disabled if compression method compatible with FCC_HANDLER cannot be written |
| QUALITY | Compression quality (with AVI, JPEG conversion) -1: disabled |
| COMP_KEYFRM | Number of frames to insert key frames |
| COMP_BPS | Data ratio (Byte/sec) |
| COMP_STATE | Configuration parameter of compression program (CODEC). – Parameter is 510 characters or less. |

| | |
|---------------|---|
| | (This configuration parameter will be effective when the parameter of COMP_STATE_EX key is invalid.) |
| COMP_STATE_EX | File name of a CODEC Configuration file (CSDT) which is a configuration parameter of compression program. (COMP_STATE_EX key is created when the size of configuration parameter is 512 characters or more.) |
| AVI_FPS_SCALE | Denominator of AVI frame rate value created |
| AVI_FPS_RATE | Numerator of AVI frame rate value created |
| AVI_CONV_TYPE | Type of AVI file format used 1: Use AVI1.0 format 2: Use AVI2.0 format |
| SOFT_MJPEG | Compression settings 0: CODEC 1: MJPEG |
| BPC | Bit length (8/16) |
| CH_COUNT | Channels (1/3) |
| IMAGE_TYPE | Type of image Selectable values: RGB, RAW2, BW |

Type of Output File and BPC/ CH_COUNT/IMAGE_TYP

| Type of Output File | BPC | CH_COUNT | IMAGE_TYPE |
|---------------------------|-----|----------|------------|
| TIFF16 (RAW) | 16 | 1 | RAW2 |
| TIFF16 (Monochrome 16bit) | 16 | 1 | BW |
| TIFF48 (48bit) | 16 | 3 | RGB |

• HDR Settings

| Key | Description |
|----------------------------|--|
| ACSHDRTONEMAPSEL | Tonemap selection for HDR function. 0: Tonemap1, 1: Tonemap2 |
| ACSHDRCONVERTMODE | Conversion mode. 0: Use tone map 1, normal exposure image 2: short exposure image |
| ACSHDRTONEMAP1PARAMS_Y_BP | Parameter for tone map 1: Y_BP |
| ACSHDRTONEMAP1PARAMS_E_BP | Parameter for tone map 1: E_BP |
| ACSHDRTONEMAP1PARAMS_E_MAX | Parameter for tone map 1: E_MAX |
| ACSHDRTONEMAP2PARAMS_E_CP | Parameter for tone map 1: E_MAX |
| ACSHDRTONEMAP2PARAMS_E_MAX | Parameter for tone map 2: E_MAX |

Parameter Settings File (PRM file)

Parameter Settings File (PRM) is described on settings of recording conditions etc.

- Camera information

| Key | Description |
|-------------|-------------------------|
| NICKNAME | Nickname |
| IPADDRESS | IP address |
| DEV_TYPE | Model |
| DRP_VERSION | Camera firmware version |
| CID | CID |
| ID | ID |

- Recording settings

| | |
|----------------|----------------------|
| FRAME_RATE_STR | Frame rate |
| FRAME_SIZE_STR | Frame size |
| TRIGGER | Trigger |
| TRIGGER_VAL | Custom trigger value |
| SHUTTER | Shutter |
| SHUTTER_VAL | Custom shutter value |
| COMMENT | Comments |

• Image Quality Adjustment

| Key | Description |
|------------------|---|
| WB | White Balance (WbAuto: Auto White Balance, WbReg: REG White Balance, Wb3100: Lighting color temperature 3100K, Wb9000: Lighting color temperature 9000K, WbSet: User Setting, --- : Unsupported) |
| GAIN | Gain(LOW:0dB, NORMAL:6dB, HIGH:12dB) |
| GAMMA | Gamma(OFF: Disabled, LOW: Low, NORMAL: Normal) |
| ENHANCE | Enhance (OFF: Disabled, LOW: Low, HIGH: High) |
| CHROMA | Chroma (--- : Unsupported) |
| KNEE | Knee |
| LOWLIGHT | Low light |
| CURSEG | Current segment number |
| ESTMODE | EST mode |
| REC_METHOD | Recording method |
| REC_NUMBLK | Division number of recording block |
| LUT_SEL | Luminance (NORMAL, LINEAR, CUSTOM, TABLE) |
| LUT_CUSTOM_MIN | Minimum value for custom luminance |
| LUT_CUSTOM_MAX | Maximum value for custom luminance |
| LUT_CUSTOM_GAMMA | Gamma for custom luminance |
| SENSORGAIN | Sensor gain |

• HDR

| Key | Description |
|--------------------------|--|
| HDR_LEVEL_REC | [For recording] HDR level |
| HDR_TONEMAP_SEL_REC | [For recording] Selection of tonemap |
| TONEMAP1PARAM_Y_BP_REC | [For recording] Tonemap1 parameter Y_BP |
| TONEMAP1PARAM_E_BP_REC | [For recording] Tonemap1 parameter E_BP |
| TONEMAP1PARAM_E_MAX_REC | [For recording] Tonemap1 parameter E_MAX |
| TONEMAP2PARAM_E_CP_REC | [For recording] Tonemap2 parameter E_CP |
| TONEMAP2PARAM_E_MAX_REC | [For recording] Tonemap2 parameter E_MAX |
| HDR_LEVEL_PLAY | [For playing] HDR level |
| HDR_TONEMAP_SEL_PLAY | [For playing] Selection of tonemap |
| TONEMAP1PARAM_Y_BP_PLAY | [For playing] Tonemap1 parameter Y_BP |
| TONEMAP1PARAM_E_BP_PLAY | [For playing] Tonemap1 parameter E_BP |
| TONEMAP1PARAM_E_MAX_PLAY | [For playing] Tonemap1 parameter E_MAX |
| TONEMAP2PARAM_E_CP_PLAY | [For playing] Tonemap2 parameter E_CP |
| TONEMAP2PARAM_E_MAX_PLAY | [For playing] Tonemap2 parameter E_MAX |

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February 2025