

Gigabit Ethernet Interface

**Connections Manual
Rev. 4.09 E**

Photron

The copyright of this manual is held by PHOTRON LIMITED.

Product specifications and manual contents are subject to change without notice.

PHOTRON LIMITED bears no responsibility for any results by using our products nor by applying this manual to any operations.

The official name of Windows is the Microsoft Windows Operating System.

Microsoft, Windows, and the logo of Windows are trademarks of Microsoft Corporation of the United States and/or its affiliated companies.

Other company names and product names listed in this manual are registered trademarks or trademarks of their respective companies.

Product specifications and features can change for the purpose of improvement without notification.

Introduction

Thank you for your purchasing a Photron high-speed camera system. This manual contains the operating instructions and warnings necessary for connecting the high-speed camera system to a PC.

Before operating the unit, read this manual thoroughly, and retain it for future reference. If any part of this manual is unclear, contact Photron using the contact information printed in “A2 Contacting Photron” at the end of this manual.





Using the Manual

This section explains the layout of the manual.

- ◆ Introduction
Explanation on this manual
- ◆ Chapter 1 Preparation
Explanation on the settings for connection
- ◆ Chapter 2 Troubleshooting
Troubleshooting for connection failure.

Manual Notation

The following icons and symbols are used in the explanations in this manual.

Icon/Symbol	Description
 IMPORTANT	This symbol indicates content that should always be read.
 CAUTION	This symbol indicates instructions that should always be followed when using the software, or things to be careful of when using the software.
 NOTE	This symbol indicates supplementary items to be aware of when using the system.
 REFERENCE	This symbol indicates the location of a reference.
“ ”	This symbol is used to indicate the names of items on a screen, references, dialog names, and connectors.
[]	This symbol is used to indicate menu names, and sub-menu names.

Important Notice

Common to 1GbE/10GbE connection

- This document explains a brief procedure to control FASTCAM Series Gigabit Ethernet interface models with control software “Photron FASTCAM Viewer 4” (referred to below as PFV4). The procedure may vary depending on the environment of the PC you are using, especially its OS and network card device. Use this document as a reference example when checking the settings.
- The explanations in this document include the PFV4 settings. The PFV4 must be installed in advance.
- This document presumes one-on-one operation between the PC and the camera on a closed network and includes explanations of the simplest connection method. If you wish to know how to make a connection in a more complicated case, for example, connecting multiple camera systems, connecting cameras to an existent network, applying the use of USB adapter, contact Photron for help.
- The Gigabit Ethernet Interface of the FASTCAM series is compatible with 1000BASE-T and 10GBASE-T standard (10GBASE-T is limited to certain models). You cannot directly connect it to a PC which is compatible with only 10BASE-T or 100BASE-TX (including 1000BASE-T for 10GBASE-T). It is possible to connect through a switching hub that supports 10BASE-T, 100BASE-TX, or 1000BASE-T, but we do not recommend it due to a decrease in performance. The use of USB adapter will enable connecting to PCs without onboard LAN adapter though it may lead to decrease in performance.

For 1GbE connection

- You can use a commercial LAN cable to connect FASTCAM series to a PC, though we basically recommend using the LAN cable which comes with the FASTCAM camera. When you use a commercially available LAN cable, be sure to use an STP or UTP cable which is beyond the Enhanced Category 5 (CAT5e) standard.

For 10GbE connection

- You can use a commercial LAN cable to connect FASTCAM series to a PC, though we basically recommend using the LAN cable which comes with the FASTCAM camera. When you use a commercially available LAN cable, be sure to use an STP cable which is beyond the Category 7 (CAT7) standard.
- Depending on the environment, 10GbE connection may not be stable. Check the operation in advance or contact Photron for support.

Contents

Chapter 1 Preparation	8
1.1. Device Connections.....	9
1.1.1. Minimum Equipment Connection.....	9
1.1.2. Connecting the FASTCAM SA-X2/SA-Z to the PC.....	12
1.2. Network Setting on PFV	14
1.2.1. PC Network Settings.....	15
1.2.2. Network Settings on the PC (Manual).....	16
1.3. Confirming Camera System IP Address.....	25
1.4. Optimizing Packet Setting.....	26
1.4.1. PFV4 Optimization.....	26
1.5. Graphics Chip Setting.....	33
1.6. Packet Settings of PFV4 (Manual).....	37
Chapter 2 Troubleshooting	39
2.1. Troubleshooting.....	40
2.1.1. Check that the camera's LINK LED lights up.....	40
2.1.2. Check the IP address on the PC	40
2.1.3. Check the Windows Firewall settings.....	41
2.1.4. Automatically search for the camera with PFV4.....	41
2.1.5. Checking the connection between the camera and PC from command prompt	42
2.1.6. Check the [User Account Control] settings	43
2.1.7. PC Ethernet Adapter Driver Update	44
2.1.8. Check any third-party firewall settings.....	45
2.1.9. Check the following points when using the FASTCAM SA-X2/SA-Z	45
2.1.10. Precautions after confirming all the procedures.....	45
A. Appendix	46
A1. FAQ.....	47
Q1. Is a driver required for Gigabit Ethernet interface, as is the case with IEEE1394 and optical interface systems?	47
Q2. What is "Jumbo Frame"?	47
Q3. What is the difference between simply selecting [Auto detection] and selecting [Select IP-address] to register each IP address on [IP-address dialog]?	47
Q4. Is it possible to use the camera systems by connecting them to an existing 1000BASE-T network? Is it also possible to control the cameras in a WAN- connected network (e.g., controlling a camera remotely from other locations)?	48
Q5. How can multiple camera systems be connected to one PC?	48
A2. Contacting Photron.....	49

1

Chapter 1 Preparation

This chapter explains on the settings for connection.

1.1. Device Connections

1.1.1. Minimum Equipment Connection

The minimum connection for using the camera is as follows.



1. Connect between the camera system and PC with the provided LAN cable.
2. Power the camera on.
3. Make sure that the [Link] LED on the camera system and that on the PC (Ethernet) are on.



NOTE

It may take about 30 seconds for the camera system to start up.



REFERENCE

See the hardware manual for each camera for the detailed procedure to connect the camera.

■ Appearance of FASTCAM Nova series



■ Appearance of FASTCAM Mini AX / WX / UX



■ Appearance of FASTCAM MH6



1.1.2. Connecting the FASTCAM SA-X2/SA-Z to the PC

The Photron FASTCAM SA-X2/SA-Z high-speed cameras are equipped with two Gigabit Ethernet interface connectors. They enable simultaneous use of both connectors for high-speed downloads.

1. Set the IP address on the PC.

Refer to the “1.2.1 PC Network Settings” on page 15 for the settings.



CAUTION

- Do not use the same IP address on the PC as the FASTCAM SA-X2/SA-Z. If the SA-X2/SA-Z IP address is used on the PC, then the SA-X2/SA-Z and PC addresses will conflict with each other, which may cause such issues as the PC not recognizing the camera or live video not being displayed.

Factory default IP address for the FASTCAM SA-X2/SA-Z

GIGABIT ETHER 1

IP address: 192.168.000.010
Subnet mask: 255.255.255.000
Default gateway: 000.000.000.000

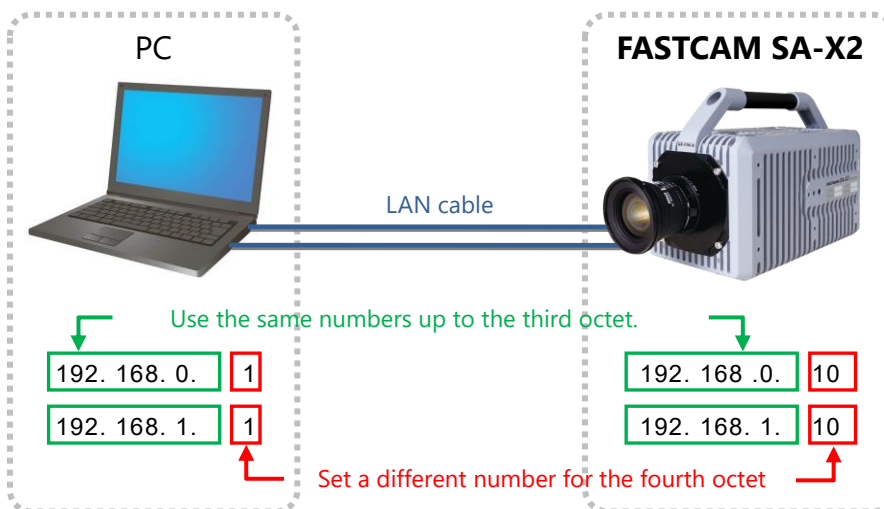
GIGABIT ETHER 2

IP address: 192.168.001.010
Subnet mask: 255.255.255.000
Default gateway: 000.000.000.000

- The SA-X2/SA-Z have two Gigabit Ethernet interface connectors, so there is an IP address for each connector. Set an IP address for the PC that is different from both of these addresses.

2. Insert two LAN cables into the Gigabit Ethernet interface connectors to connect the camera and the PC.

■ IP address setting example



CAUTION

- Refer to the FASTCAM SA-X2/SA-Z hardware manual for details about how to connect the camera.
- Different PCs cannot be connected to “GIGABIT ETHER1” and “GIGABIT ETHER2” and operated.

3. Turn on the camera's power supply.
Confirm that the SA-X2/SA-Z LINK LED and the PC (Ethernet) LINK LED are lit up. The "GIGABIT ETHER1" Link LED on the SA-X2/SA-Z corresponds to "IF1 LINK/TRANS" and the "GIGABIT ETHER2" to "IF2 LINK/TRANS".
4. Start the PFV4.



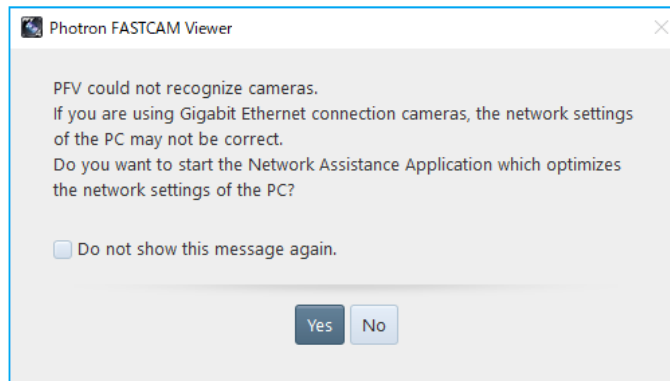
NOTE

When high-speed downloading using both Gigabit Ethernet connections is enabled, the LEDs for "IF1 LINK/TRANS" and "IF2 LINK/TRANS" flash during downloads. If one of the LEDs is not flashing, then high-speed downloading may not be enabled. Refer to "2.1 Troubleshooting" on page 40 for more details.

1.2. Network Setting on PFV

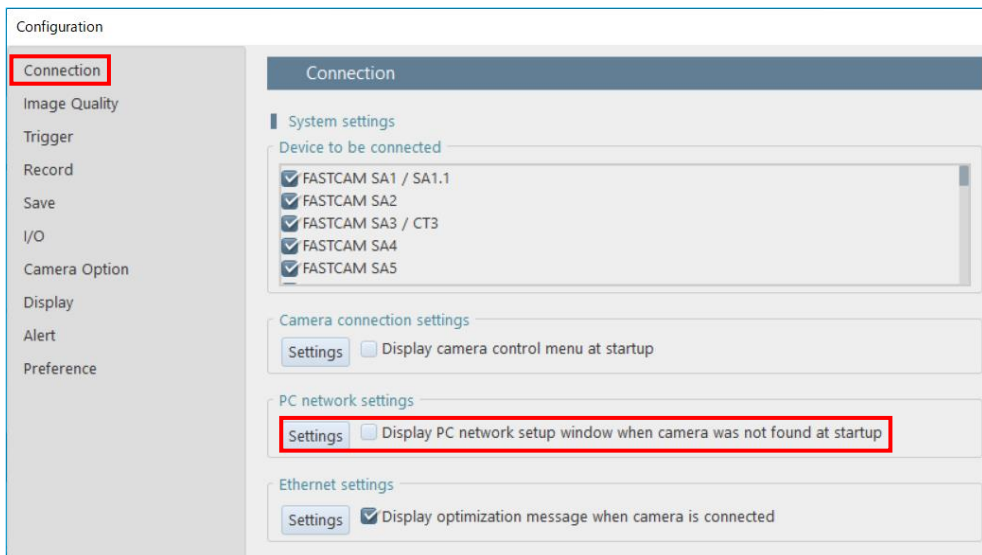
You can change the network settings of your PC from PFV4.

A message is displayed if the camera cannot be detected when the PFV4 launches. Click the [Yes] button to display the network settings window.



Check [Do not show this message again] to skip the display of this message the next time it cannot communicate with the camera.

If the message is not displayed and the camera cannot be connected, configure the settings from [MENU] - [Configuration] - [Connection] - [PC network] and click the [Settings] button.



NOTE

To display the message for every failure in connecting the camera and PFV4, go to [MENU] - [Configuration] - [Connection] - [PC network] and put a check in the box of [Display PC network setup window when camera was not found at startup].

1.2.1. PC Network Settings

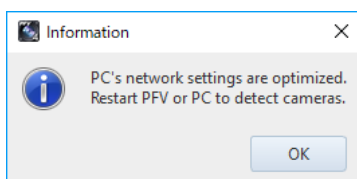
Here is the description of PC network settings.

The screenshot shows the 'PC network settings' window. It contains instructions at the top and three main sections highlighted with red boxes and labels:

- (A) Select LAN Port:** A table with columns 'Name', 'Device Name', 'IP Address', and 'Subnet Mask'. The first row, 'Ethernet 10', is selected. Other rows include 'Ethernet 9', 'Ethernet 8', 'Ethernet 7', and 'Ethernet 6'.
- (B) Set the LAN port's IP address for connecting with cameras:** A section with checkboxes. The 'Set the LAN port's IP address for connecting with cameras' checkbox is checked. Below it are input fields for 'IP Address' (192 . 168 . 0 . 1), 'Subnet Mask' (255 . 255 . 255 . 0), and 'Default Gateway'. 'Set' and 'Reset' buttons are at the bottom.
- (C) Set PFV to the allowed program list of Windows Firewall:** A section with a checked checkbox 'Set PFV to the allowed program list of Windows Firewall'. Below it is a 'Caution' section with several bullet points and a 'Details' link.

At the bottom right of the window is a 'Close' button.

No.	Name	Description
(A)	Select LAN Port	Select the network card which is currently connected to the camera. Only the number of cards connected to the PC is displayed. Note: Be careful not to select a network card that is not connected to the camera. Click the [Refresh] button to update to the current settings.
(B)	Set the LAN port's IP address for connecting with cameas	If the box is checked: Specify the [IP Address], [SubnetMask], and the [Default Gateway] shown in the frame. If the box is not checked: Use the DHCP connection without specifying the IP address information. Click the [Set] button to update the settings. Click the [Reset] button to return the IP address settings to the original values when the app launched.
(C)	Set PFV to the allowed program list of Windows Firewall	If the box is checked: Register "PFV" to the list of firewall exceptions. If the box is not checked: Delete "PFV" from the list of firewall exceptions. Note: The list of exceptions is forcefully enabled and turned on when the app launches.

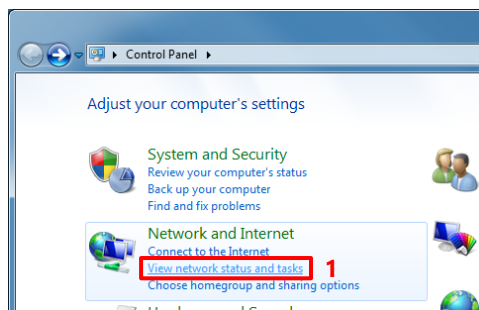


1. After the setup is completed, click the [Close] button to display the following message:
2. Reboot the PFV4 or the PC.

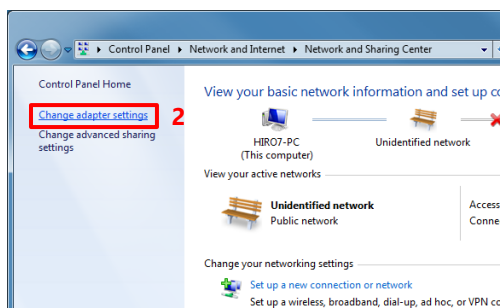
1.2.2. Network Settings on the PC (Manual)

Here is the description of how-to setup manually with respect to each OS.

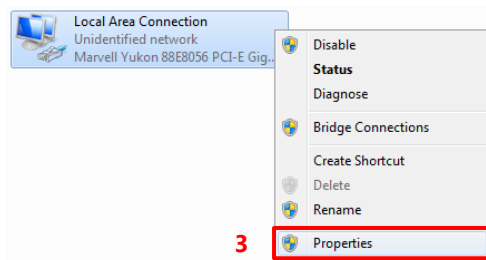
■ Setting with Windows 7



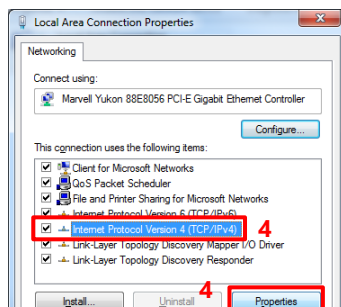
1. From the [Start] menu, click the [Control Panel], then click [View network status and tasks].



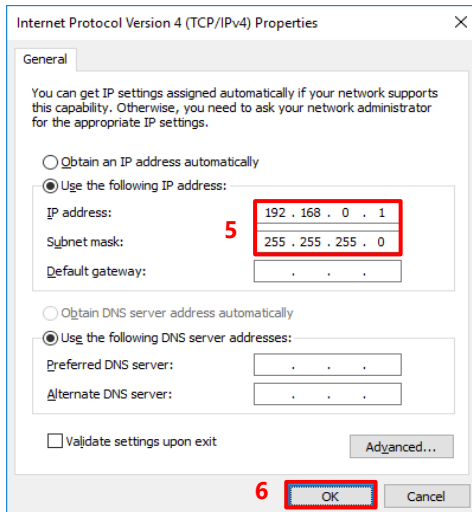
2. Under Tasks located on the left-hand side of the window, click [Change adapter settings].



3. Right click the [Local Area Connection] icon (when multiple Local Area Connections exist, use the one with Gigabit Ethernet interface), and select [Properties] in the popup menu, then [Local Area Connection Properties] dialog will be displayed.



4. Select the [Internet Protocol Version4 (TCP/IPv4)] in the [Local Area Connection Properties] dialog, then click the [Properties] button.

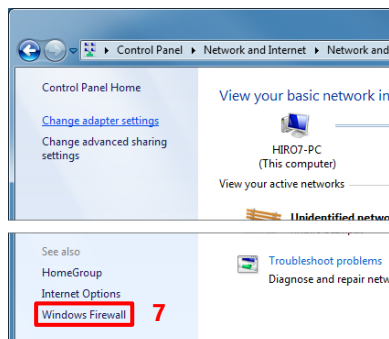


5. Select [Use the following IP address] and enter the following numbers:
 - IP address: 192. 168. 000. 001
 - Subnet mask: 255. 255. 255. 000
6. Click [OK], and then go back to the [View network status and tasks].

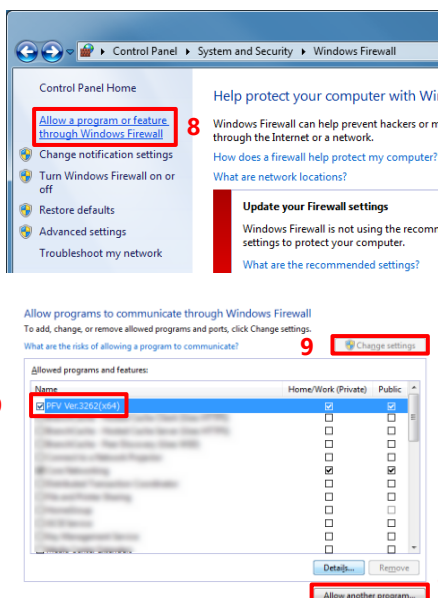


NOTE

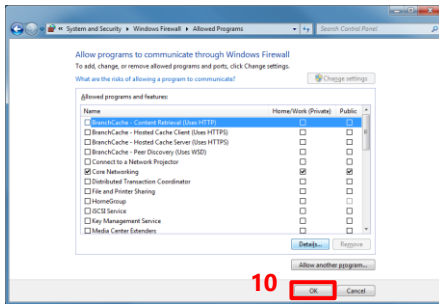
There is no need to fill out [Default gateway]. The [Use the following DNS server address] may be empty as well.



7. Click [Windows Firewall].



8. Click [Allow a program or feature through Windows Firewall].
9. From the “Allow programs to communicate through Windows Firewall” window, click the [Change settings] button, put a check into the box of PFV4 and click the [Allow another program. . .] button.



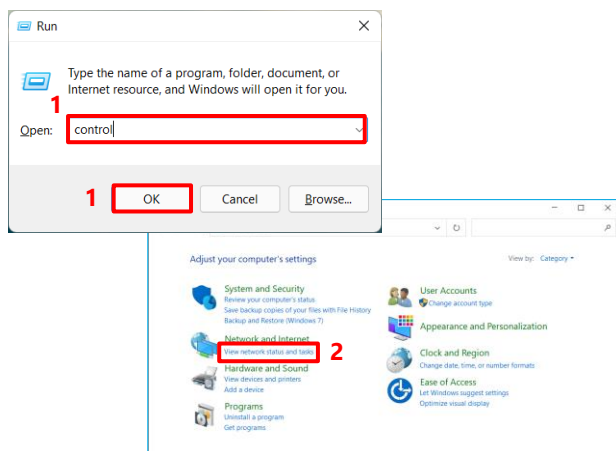
10. Click the [OK] button to close the [Windows Firewall].



NOTE

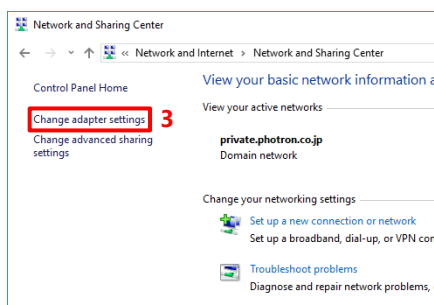
- It also does work when “Disable (Not recommended)” is selected. As the firewall is entirely disabled in this case, it is not recommended.
- If the PC has other security software firewalls, you may have to make the PFV4 exception for each firewall. For information on the specific way of setting, refer to the relevant manual of the security software.

■ Setting with Windows 10

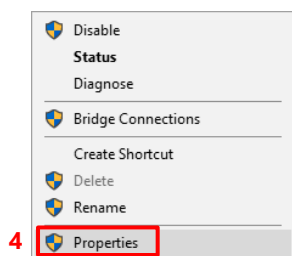


1. Press the [Win] key and [R] key, enter “control” and click the [OK] button to open the Control Panel.

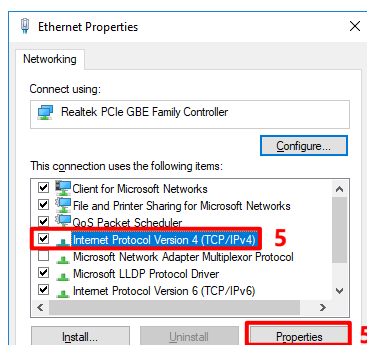
2. Click [View network status and tasks].



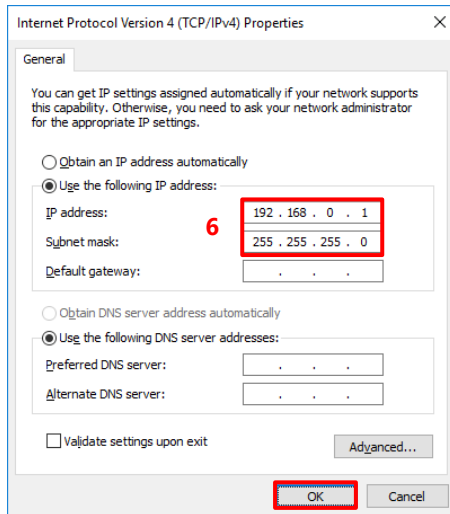
3. Under Tasks located on the left-hand side of the window, click [Change adapter settings].



4. Right click [Network Connection] (if there is more than one, choose the one of interface of Gigabit Ethernet you use), click [Properties] from the menu to show the [Properties] dialog.



5. Select the [Internet Protocol Version 4 (TCP/IPv4)] in the dialog, then click the [Properties] button.

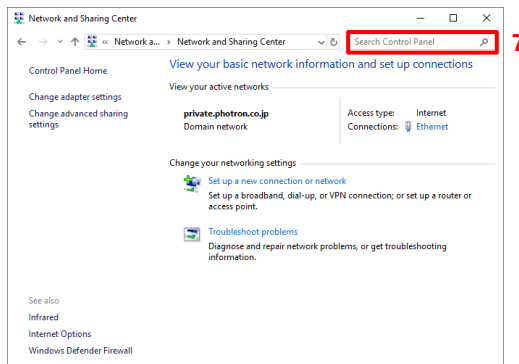


6. Select [Use the following IP address], enter the following numbers and click the [OK] button.
 - IP address: 192.168.0.001
 - Subnet mask: 255.255.255.000

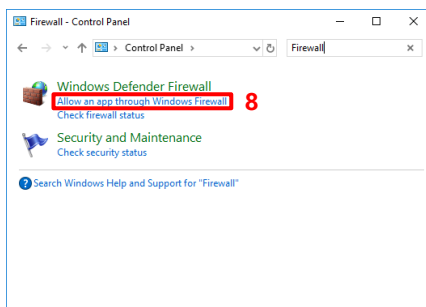


NOTE

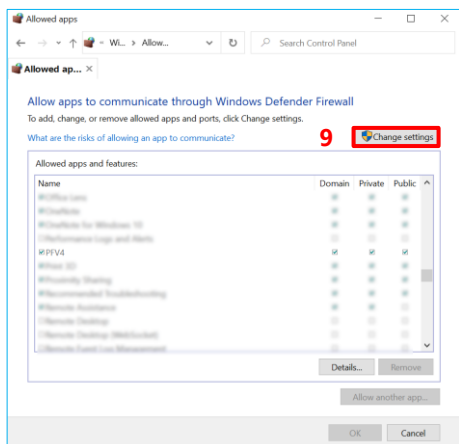
There is no need to fill out [Default gateway]. The [Use the following DNS server address] may be empty as well.



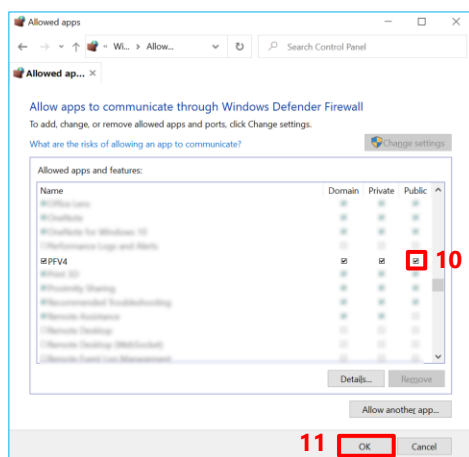
7. Go back to the [Network and Sharing Center] window mentioned in the step 2, enter “Firewall” into “Search Control Panel” and perform a search.



8. Click “Allow an app through Windows Firewall” among the result of the search.



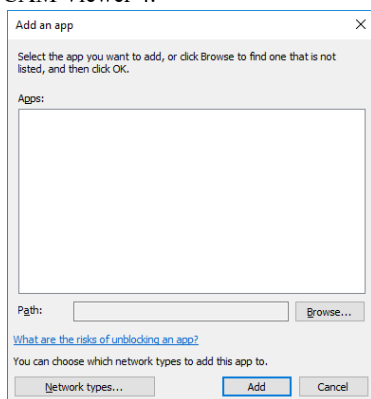
9. Click the [Change settings] button to enable the checked items.



10. Find out PFV4 from among the list of [Allowed apps and features] and put a check in the box of [Public].
11. Click the [OK] button and close the dialogs in sequence.

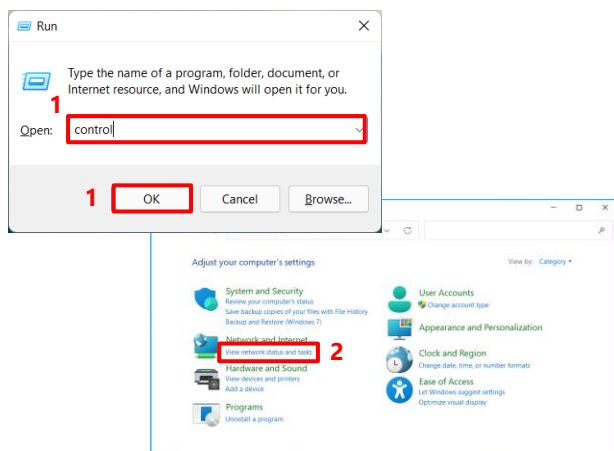
NOTE

- If PFV4 is not listed under “Allowed apps and features”, click the [Allow another app] button, specify the “exe” file of PFV4 and add PFV4 to the list. By default, the path is C:\Program Files\Photron\Photron FASTCAM Viewer 4.



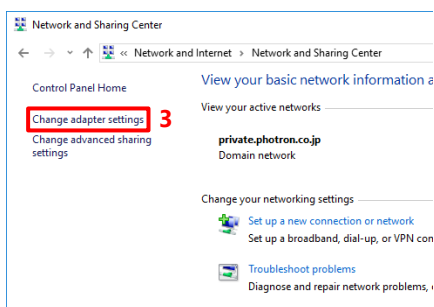
- It also does work when “Disable (Not recommended)” is selected. As the firewall is entirely disabled in this case, it is not recommended.
- If the PC has other security software firewalls, you may have to make the PFV4 exception for each firewall. For information on the specific way of setting, refer to the relevant manual of the security software.

■ Setting with Windows 11

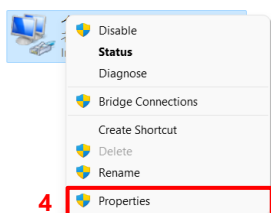


1. Press the [Win] key and [R] key, enter “control” and click the [OK] button to open the Control Panel.

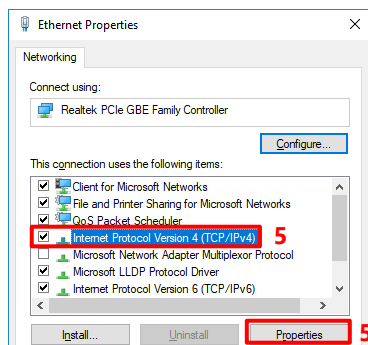
2. Click [View network status and tasks].



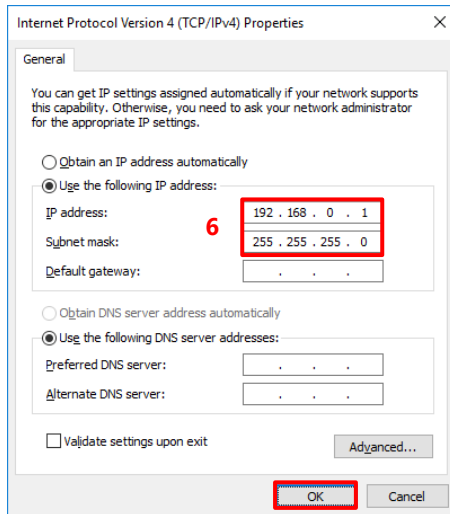
3. Under Tasks located on the left-hand side of the window, click [Change adapter settings].



4. Right click [Network Connection] (if there is more than one, choose the one of interface of Gigabit Ethernet you use), click [Properties] from the menu to show the [Properties] dialog.



5. Select the [Internet Protocol Version 4 (TCP/IPv4)] in the dialog, then click the [Properties] button.

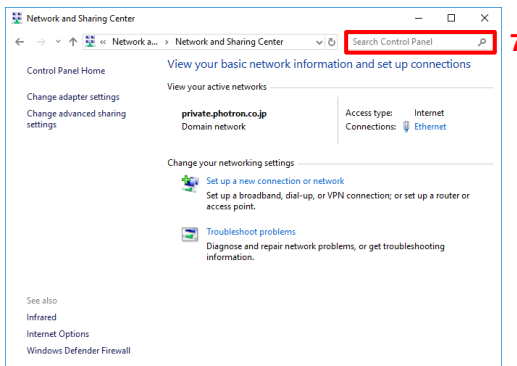


6. Select [Use the following IP address], enter the following numbers and click the [OK] button.
 - IP address: 192.168.0.001
 - Subnet mask: 255.255.255.000

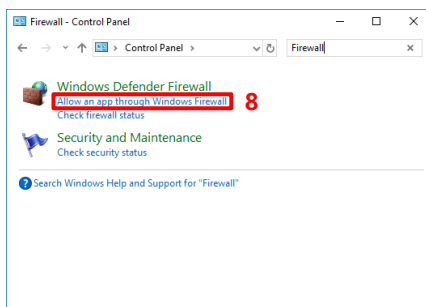


NOTE

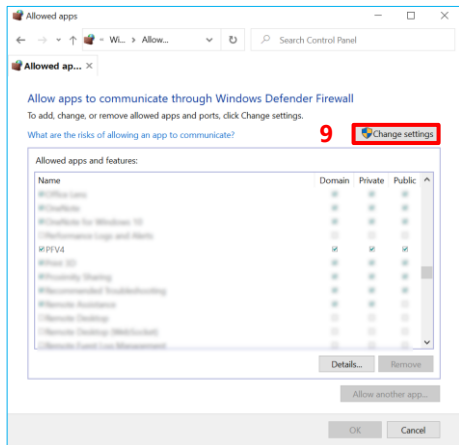
There is no need to fill out [Default gateway]. The [Use the following DNS server address] may be empty as well.



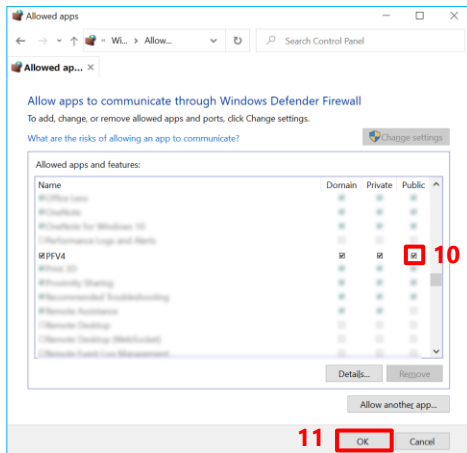
7. Go back to the [Network and Sharing Center] window mentioned in the step 2, enter “Firewall” into “Search Control Panel” and perform a search.



8. Click “Allow an app through Windows Firewall” among the result of the search.



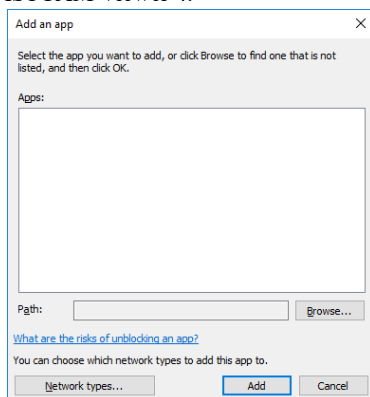
9. Click the [Change settings] button to enable the checked items.



10. Find out PFV4 from among the list of [Allowed apps and features] and put a check in the box of [Public].
11. Click the [OK] button and close the dialogs in sequence.

NOTE

- If PFV4 is not listed under “Allowed apps and features”, click the [Allow another app] button, specify the “exe” file of PFV4 and add PFV4 to the list. By default, the path is C:\Program Files\Photron\Photron FASTCAM Viewer 4.



- It also does work when “Disable (Not recommended)” is selected. As the firewall is entirely disabled in this case, it is not recommended.
- If the PC has other security software firewalls, you may have to make the PFV4 exception for each firewall. For information on the specific way of setting, refer to the relevant manual of the security software.

1.3. Confirming Camera System IP Address

The high-speed camera is assigned its IP address beforehand as follows.

Do not use this address for the settings on the PC. If the same IP address is set to the PC, a conflict occurs between the camera and the PC, which will result in such symptoms as preventing the camera from being recognized or live images from being displayed.

See “1.2 Network Setting on PFV” on page 14 for PC side settings.

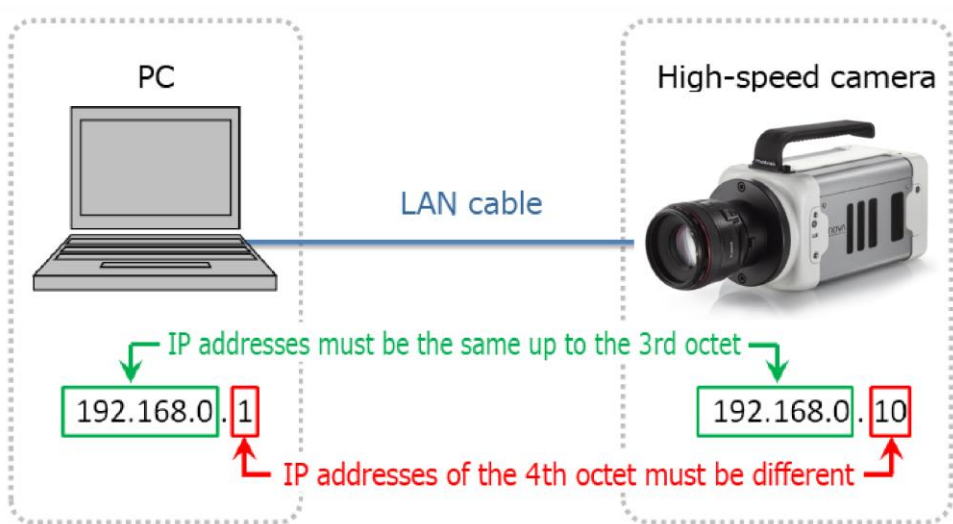
- Factory-default IP address

IP address: 192. 168. 000. 010

Subnet mask: 255. 255. 255. 000

Default gateway: 000. 000. 000. 000

- IP address example



IMPORTANT

- Set the same numbers up to the third octet and use a different number in the fourth octet for the IP address on the high-speed camera and the PC. The factory default for the fourth octet of the camera's IP address is set to 10, so set a number on the PC other than 10 that is between 1 and 254.
- When using two or more cameras, set each IP address so that they do not conflict with each other.



NOTE

- If the IP address of the high-speed camera is unknown, you can check and change it via the remote control or video monitor.
- When the camera IP address is unknown, you can reset the IP address only with the camera body. Refer to the hardware manual for detail.

1.4. Optimizing Packet Setting

Follow the procedure below to optimize the packet settings. This will improve the communication between a camera (LIVE image refresh, downloading recorded data).

1.4.1. PFV4 Optimization

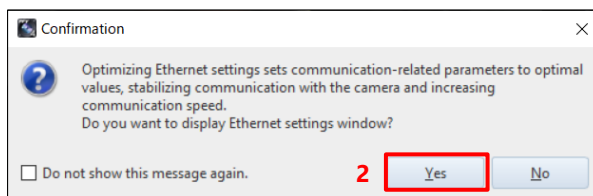
PFV4 optimization function optimizes the PC's network card settings, the PC's power settings, and packet settings.



CAUTION

- An optimization using the [Optimize] button does not work for Mini CX and MH6 connected via USB.
- Confirm the camera to use is shown in the camera list before optimizing.
When the camera or the network card to use is changed, perform an optimization again.

■ Optimize from confirmation message (optimize when camera is detected/added)



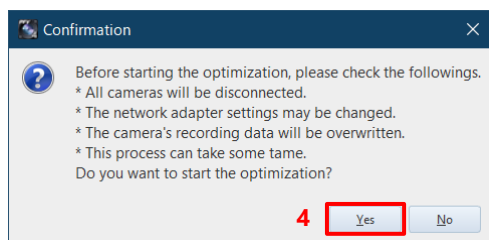
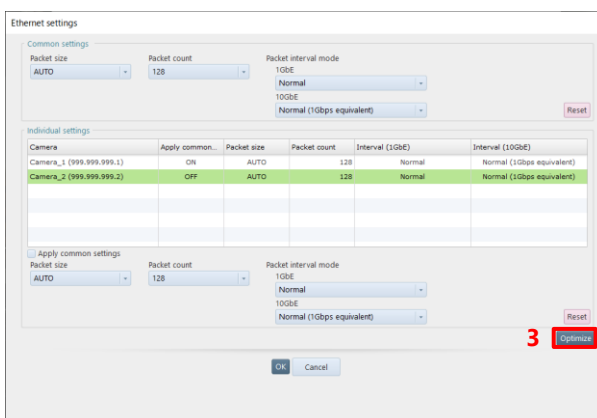
1. Start PFV.

The camera is searched, and a message is displayed.

2. Click the [Yes] button.

The “Ethernet settings” window is displayed.

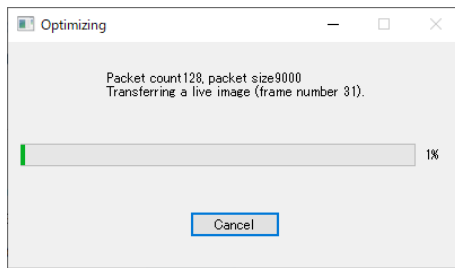
3. Click the [Optimize] button.



4. Click the [Yes] button.

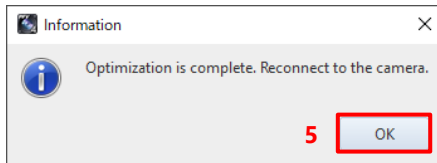
Optimization starts.

Depending upon the OS being used, the confirmation screen of the user account control will be displayed. Click the [Yes] button.



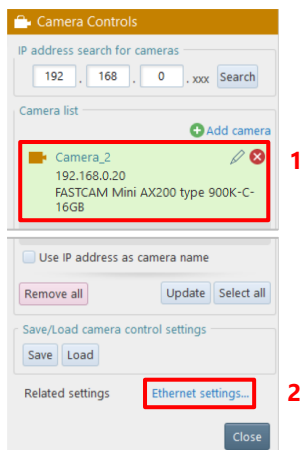
Optimization proceeding.
(required time: around 2 to 5 min.)
✖ It may take longer time under an unstable connection.

Click the [Cancel] button to cancel the optimization and return the setting before changing.

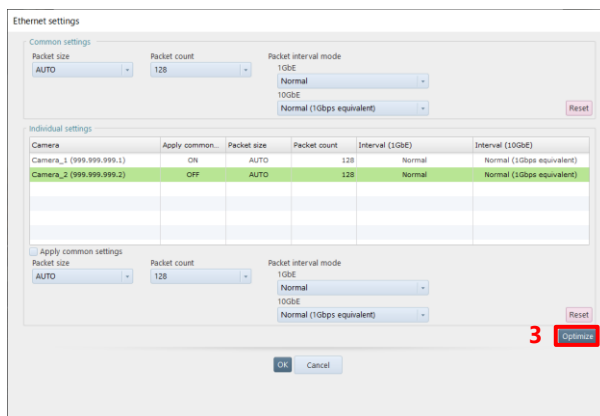


- Click the [OK] button and reconnect to the camera.

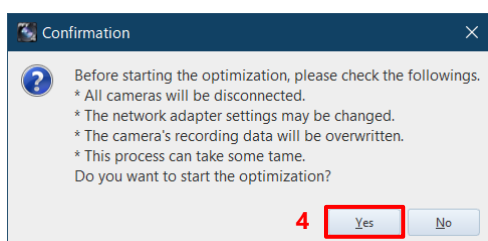
■ Optimize from Camera Controls (optimize after adding camera)



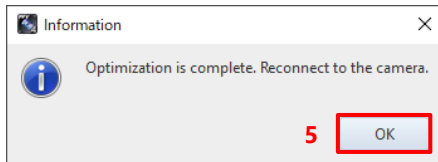
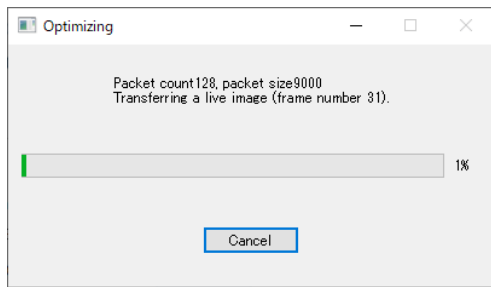
- Confirm the camera to use is shown in the camera list.
- Click [Ethernet settings] from related settings.
The “Ethernet settings” window is displayed.



- Click the [Optimize] button.



- Click the [Yes] button.
Optimization starts.
Depending upon the OS being used, the confirmation screen of the user account control will be displayed. Click the [Yes] button.



Optimization proceeding.

(required time: around 2 to 5 min.)

✖ It may take longer time under an unstable connection.

Click the [Cancel] button to cancel the optimization and return the setting before changing.

5. Click the [OK] button and reconnect to the camera.

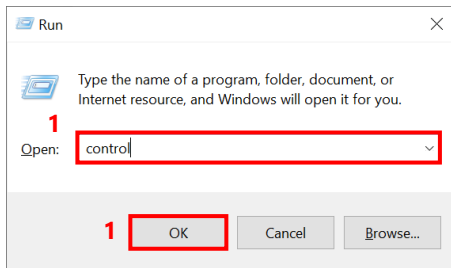
NOTE

- Optimization can be performed even when 1GbE / 10GbE cameras are connected in a mixed configuration.
- Optimization feature optimizes the following communication and settings.
 - LIVE communication in LIVE mode
 - Data download communication in MEMORY mode
 - Packet size, packet count, and packet interval mode
 - Network card settings and power plan of PC
- In case the communication remains unstable even after optimization, modify packet size, packet count, and packet interval mode manually. For details, refer to the “1.6 Packet Settings of PFV4 (Manual)” on page 37. A smaller value will more stabilize the communication, but will more reduce the communication rate at the same time.
- The optimization confirmation message is displayed each time a camera is added. If you do not want this message to appear, check the “Do not show this message again”.
To display the message again, check “Open Ethernet settings when camera is connected” in the Ethernet settings under [MENU] - [Connection].

PC power settings and network card settings are optimized in “1.4.1 PFV4 Optimization” on page 26. The procedure to manually configure the settings is described below for reference.

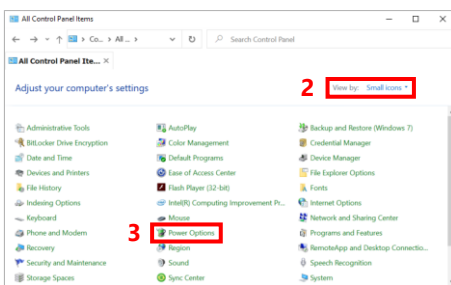
■ Power settings (Manual)

The power setting of PC has a great influence on the operation of the network card. Since this may cause poor communication with the camera, check the power settings of PC before using the camera and follow the steps below to make the settings.

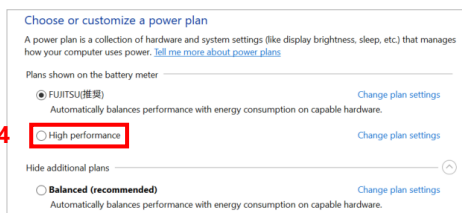


1. Press the [Win] key and [R] key, enter “control” and click the [OK] button to open the Control Panel.

Control Panel opens.



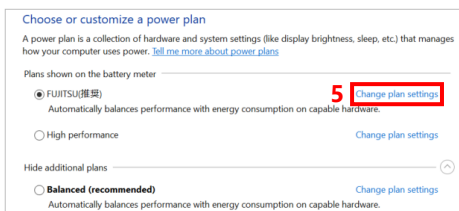
2. Change [View by] to “Small icons”
3. Click the [Power Options] menu.



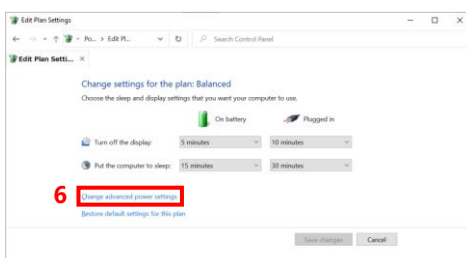
4. If there is [High Performance] setting in the power plans, select it to complete the power setting.

Exit the power settings menu.

■ If the [High Performance] setting is not present

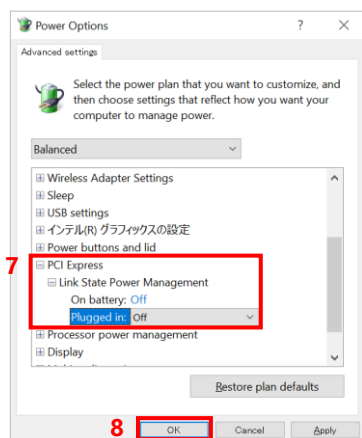


5. Click [Change plan settings].



6. Click [Change advanced power settings].

Change the time for the display to turn off and the time for the PC to sleep, if necessary.



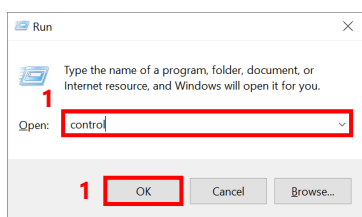
- Click [PCI Express] and [Link State Power Management], and then change [Plugged in:] to “Off”.

If you are using a laptop to run on battery power, change [On battery:] to “Off” as well.

- Click the [OK] button to complete the power setting.

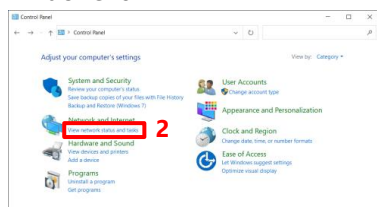
■ Network Card Setting

Change the Jumbo Frame setting of the network card and disable the power saving setting.

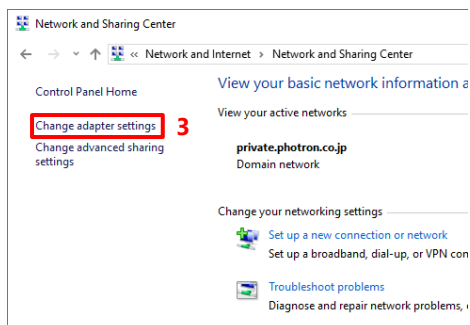
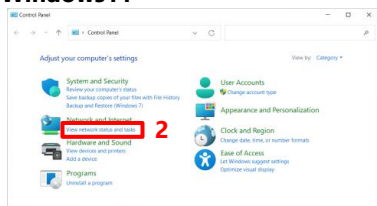


- Press the [Win] key and [R] key, enter “control” and click the [OK] button to open the Control Panel.
- Click [View network status and tasks].

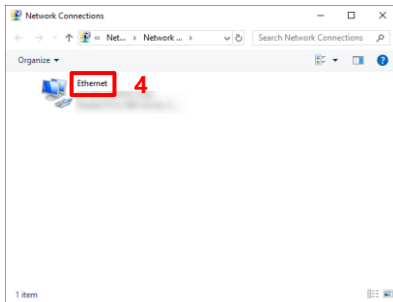
Windows10



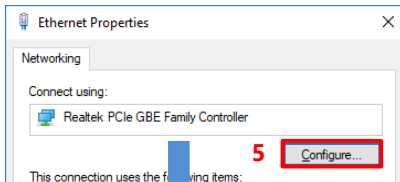
Windows11



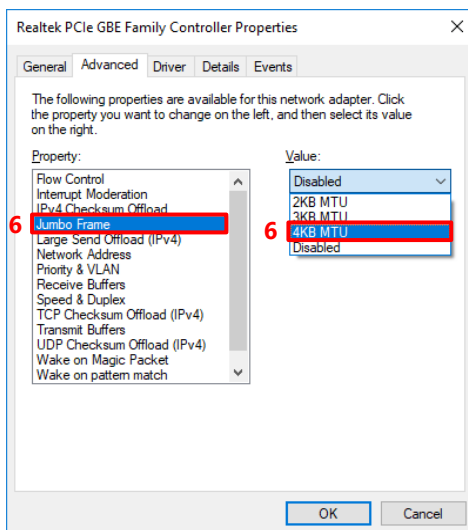
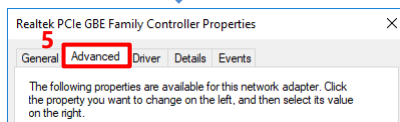
- Click “Change adapter settings” at the upper left corner of the dialog to show the [Network Connections] dialog.



4. Right click [Local Area Connection] (if there is more than one, choose the one of interface of Gigabit Ethernet you use) and select [Properties] from the menu. The properties dialog will appear.



5. Click the [Configure. . .] button from the dialog. When another dialog is displayed, click the [Advanced] tab in the latter dialog.

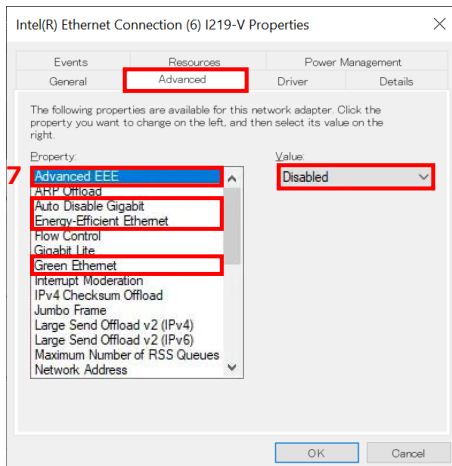


6. Set [Jumbo Frame] with the settable maximum value. The example shown on the left-hand side is a case where a settable board is used.



CAUTION

- Depending on the network card being used, the settings may be different from this document.
- Some network cards lack the “Jumbo Frame” feature.
- The communication may be more stable in some network cards by not using the “Jumbo Frame” feature.



7. Disable all of the following items. Some of them are disabled by default.

* If the item does not exist, no setting is required.

* Some of them are disabled by default.

- Auto Disable Gigabit
- Green Ethernet
- EEE (Energy Efficient Ethernet)
- AdvancedEEE
- System idle power saver
- Reduce Speed On Power Down
- Link Speed Battery Saver
- Power saving mode



NOTE

- Set the following item only when 10GigabitEther(10GbE) is used with HUB.
 - Flow control: "Enabled, Rx & Tx Enabled"
- When the packet count or packet size value is set to a small value, set the Interrupt Moderation setting to "Disabled".

If a lot of communication occurs between the PC and the camera, the communication speed may become extremely slow if the interrupt moderation setting is enabled.

The packet count settings can be changed manually from "1.6 Packet Settings of PFV4 (Manual)".

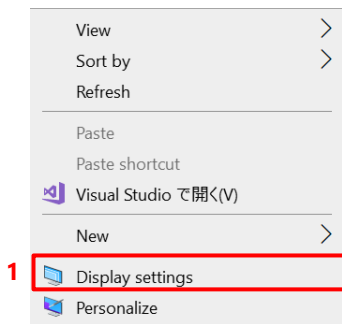
1.5. Graphics Chip Setting

If your PC is equipped with a graphics chip (discrete GPU), set it to be used for PFV4 processing.
If your PC is not equipped with a discrete GPU, the following settings are not necessary.

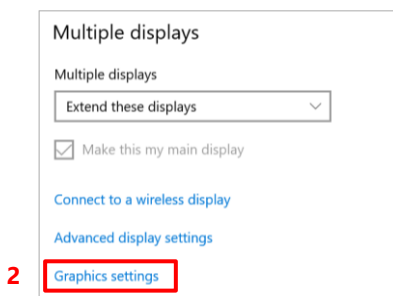
The graphics chip enables faster processing of the following functions.

- ◆ Speed up when using image processing/correction related functions:
LUT, Saturation, HDR, Lens Calibration, Stabilization, Keystone Correction, B/G Subtraction, Overexposure Alert, Focus Assistance, Image Overlay, Pseudo Color, Filter (Spot Noise Reducer only), etc.
- ◆ Faster live update when using multiple cameras
- ◆ Faster playback when multiple data are opened

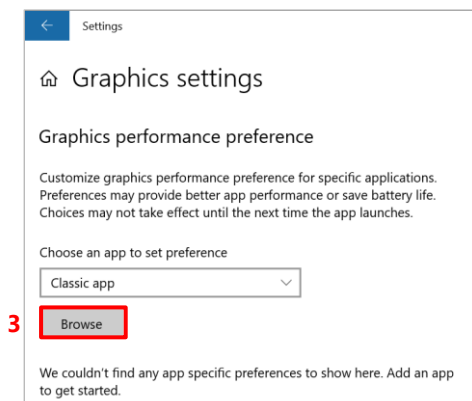
Setting with Windows10



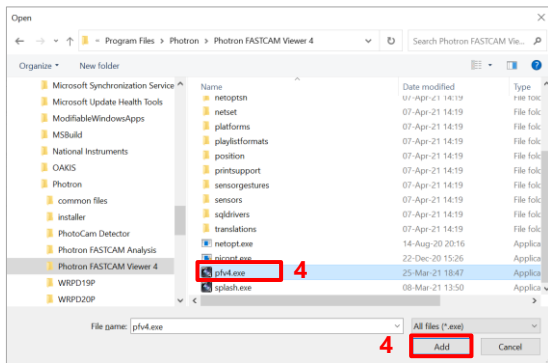
1. Right-click on the Windows desktop, and then click [Display settings].



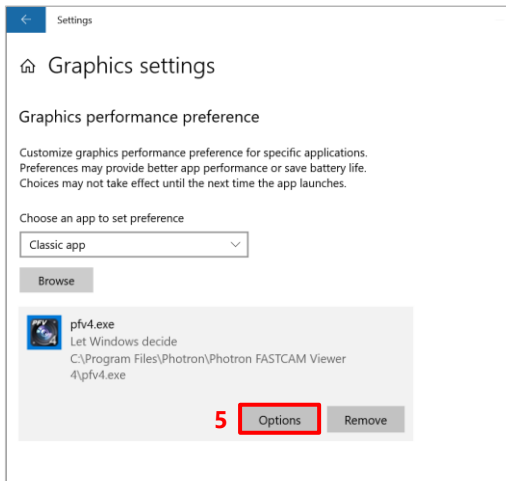
1. Scroll down the Display Settings screen and click [Graphics settings].



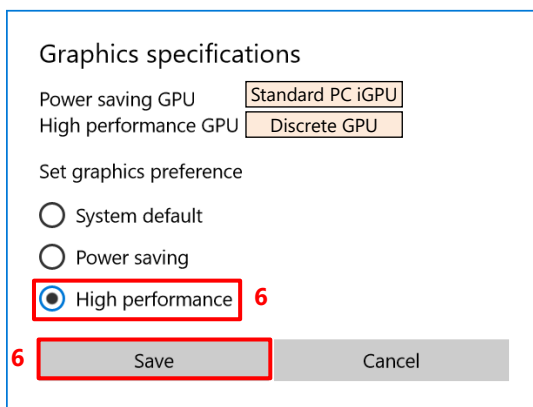
2. Click the [Browse] button under “Choose an app to set preference” on the Graphic Settings screen.



3. The “Open” window will open. Select the “pfv4.exe” from Program Files folder. Click the [Add] button.



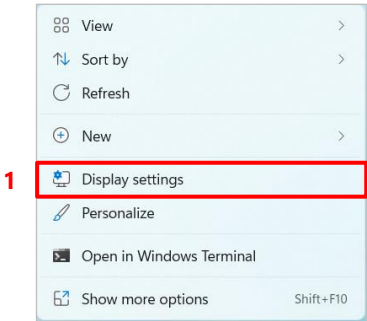
4. The “pfv4.exe” is added. Click the [Options] button.



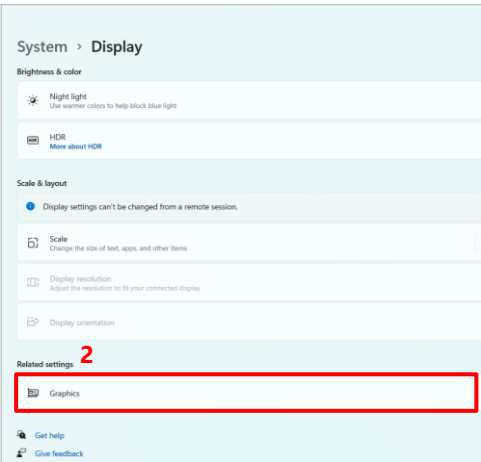
5. The “Graphics specifications” window will open. Select the “High Performance” option, then click [Save] and close the window.

* With the “System default” setting, the discrete GPU shown in the “High performance GPU” field is not used.

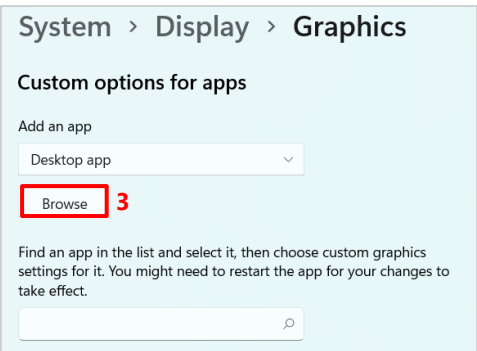
Setting with Windows11



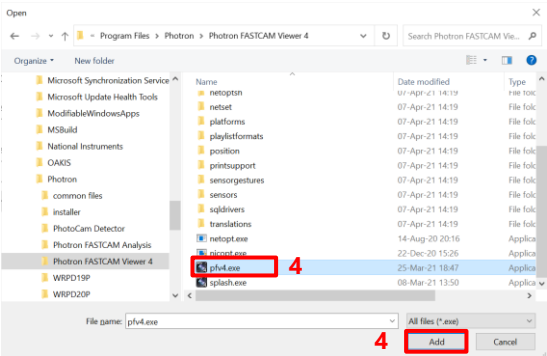
1. Right-click on the Windows desktop, and then click [Display settings].



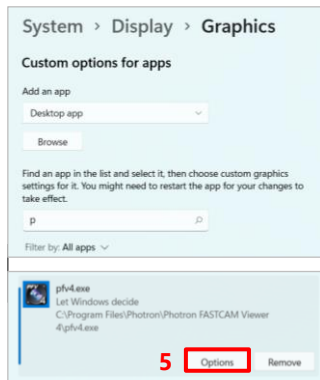
2. Scroll down the Display Settings screen and click [Graphics].



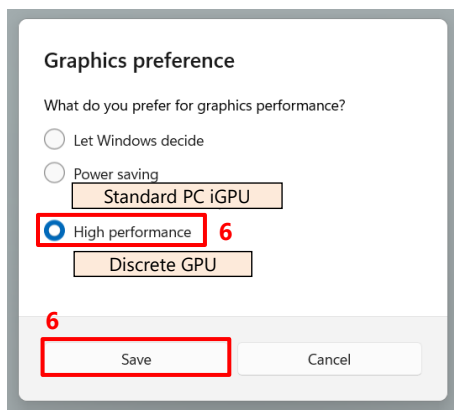
3. Click the [Browse] button under “Custom options for apps” on the Graphic Settings screen.



4. The “Open” window will open. Select the “pfv4.exe” from Program Files folder. Click the [Add] button.



5. The “pfv4.exe” is added.
Click the [Options] button.



6. The “Graphics preference” window will open.
Select the “High Performance” option, then click [Save] and close the window.

* With the “Let Windows decide” or “Power saving” setting, the discrete GPU shown in the “High performance GPU” field is not used.

1.6. Packet Settings of PFV4 (Manual)

Here is the description of the packet size and packet count settings of PFV4.

NOTE

Change the Ethernet settings following the below procedure if the communication is unstable even after the optimization or to set at your discretion. Normally this item does not require a change.

Camera Controls

IP address search for cameras

192 . 168 . 0 . xxx Search

Camera list

+ Add camera

Camera_2
192.168.0.20
FASTCAM Mini AX200 type 900K-C-16GB

☐ Use IP address as camera name

Remove all Update Select all

Save/Load camera control settings

Save Load

Related settings Ethernet settings... Close

1. Confirm the camera to use is shown in the camera list.
2. Click [Ethernet settings] from related settings.

The “Ethernet settings” window is displayed.

- To configure settings for multiple cameras at once

Individual settings

Camera	Apply com...	Packet size	Packet count
Camera_1 (999.999.999.1)	OFF	AUTO	128
Camera_2 (999.999.999.2)	ON	AUTO	128

☐ Apply common settings

3. Check if the [Apply common settings] status of the camera is set to ON. Select the camera and check the [Apply common settings] checkbox.

If it is set to OFF, the camera will be excluded from the settings in the Common Settings field.

Ethernet settings

Common settings

Packet size 1458 Packet count 128

Packet interval mode

1GbE Normal

10GbE

Slow mode

Individual settings

Camera	Apply com...	Packet size	Packet count	Interval (1GbE)	Interval (10GbE)
Camera_1 (999.999.999.1)	ON	AUTO	128	Normal	Normal
Camera_2 (999.999.999.2)	ON	AUTO	128	Normal	Normal

OK Cancel

4. Select Packet size and Packet count in the Common settings column.
5. Select Packet interval mode. For a 10GbE connection, change the Packet interval mode setting to increase the communication speed. When set to Slow mode, the speed will be low.
6. Click the [OK] button.

- To configure settings for each camera respectively

Individual settings

Camera	Apply com...	Packet size	Pac
Camera_1 (999.999.999.1)	OFF	AUTO	
Camera_2 (999.999.999.2)	ON	AUTO	

3

☐ Apply common settings

3. Select the camera you want to configure individually from the list and uncheck [Use common settings].

Individual settings

Camera	Apply com...	Packet size	Packet count	Interval (1GbE)	Interval
Camera_1 (999.999.999.1)	OFF	AUTO	128	Normal	Normal
Camera_2 (999.999.999.2)	ON	AUTO	128	Normal	Normal

4

5

6

OK Cancel

4. Select Packet size and Packet count in the Common settings column.
5. Select Packet interval mode.
For a 10GbE connection, change the Packet interval mode setting to increase the communication speed. When set to Slow mode, the speed will be low.
6. Click the [OK] button.



CAUTION

The maximum packet count depends on the camera; Nova has a maximum of 1024, and other models have a maximum of 256. You can set the packet count to 256 or more for models other than Nova, but it will work with 256.



NOTE

- By default, the packet size is set to “1458”, the packet count to “32”, and the packet interval mode to “Normal mode” respectively. Click the [Reset] button to return to these settings.
- A larger value increases the communication rate and the chance of packet loss at the same time. Optimize the value after checking the communication status.

2

Chapter 2 Troubleshooting

Troubleshooting for connection failure is described in this chapter.

2.1. Troubleshooting

If the live images are not displayed even when the camera and PC are connected with a LAN cable and the PFV4 is running, then there may be a problem with the connection between the camera and the PC.

Check the following items.

2.1.1. Check that the camera's LINK LED lights up

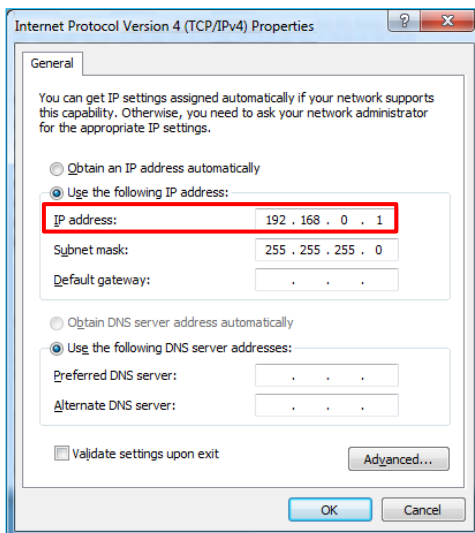
When the LINK lamp of the camera is dark, check for the connection and breaking of wire for LAN cable, and for dirty connectors. Besides that, it is assumed that the network device does not support Gigabit, or I/F board of the camera is faulty.



2.1.2. Check the IP address on the PC

An identical IP address might be shared between the camera and the PC at a time. IP address for camera is set to 192.168.0.10 by factory default configuration. For PC side, it is required that the same value as that for camera is assigned to from the first to third octet, but a different value is assigned to the fourth octet (192.168.0 is applied but the last two digits are different).

Refer to “1.2.1 PC Network Settings” on page 15 to check the IP address on the PC.



If the IP address displayed here is set to 192.168.0.10, the same address may be set on both the PC and the camera. Change the number for the fourth octet of the IP address to a number other than 10 (between 1 and 254; e.g., 192.168.0.1).

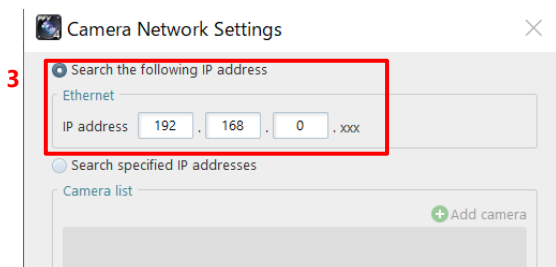
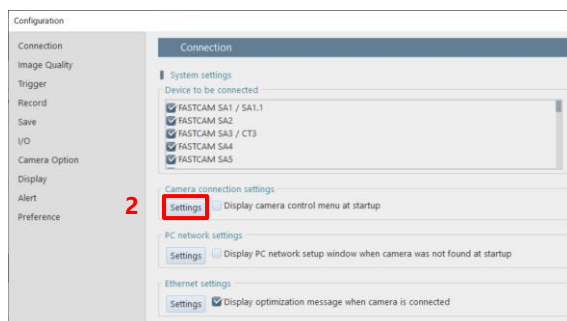
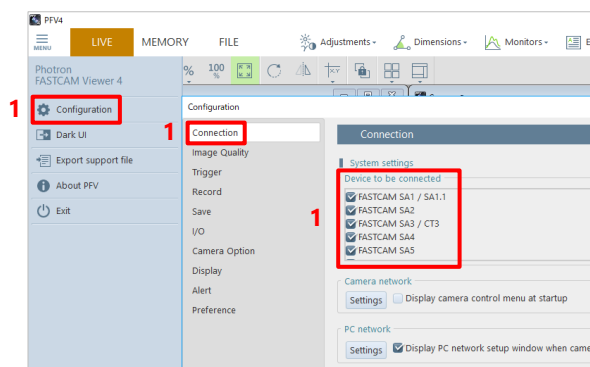
2.1.3. Check the Windows Firewall settings

Communication between the camera and the PFV4 may be blocked by the Windows Firewall. The PFV4 must be registered to the list of programs that are allowed access by the firewall.

Refer to “1.2.1 PC Network Settings” on page 15 or “1.2.2 Network Settings on the PC (Manual)” on page 16 for the detailed operating procedure.

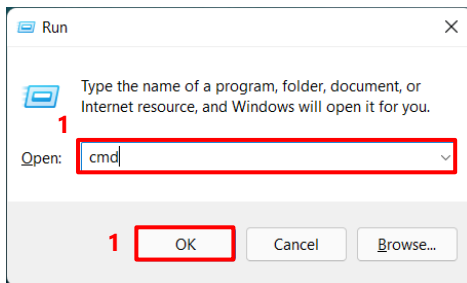
2.1.4. Automatically search for the camera with PFV4

The PFV4 includes a feature to automatically search for the specified IP address. Check the feature settings with the following procedure.

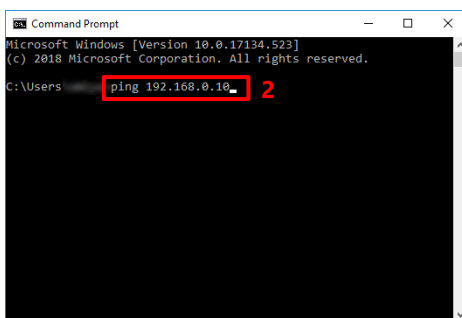


2.1.5. Checking the connection between the camera and PC from command prompt

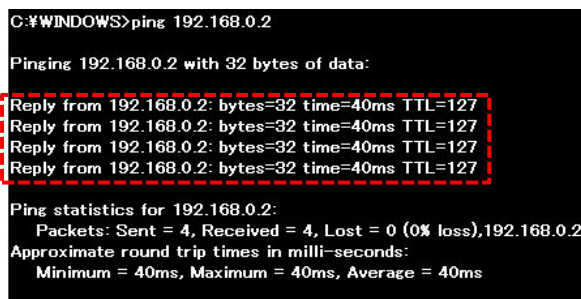
Run Ping command from command prompt to check if the connection between the camera and PC is not interrupted. Follow the below procedure.



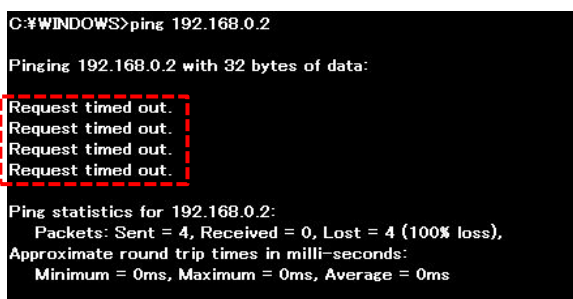
1. Press the [Win] key and [R] key, enter “cmd” and click the [OK] button to open the Command Prompt.



2. When the window is displayed, type as below before pressing the [Enter] key:
· ping 192.168.0.10



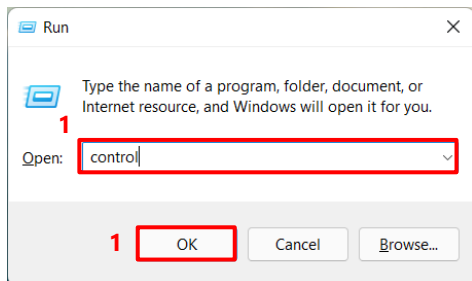
3. If strings appear as shown in the left picture, the camera is connected to PC. If the state will not change for instance PFV4 is not displaying LIVE image even in this state, then the connection might be interrupted by Firewall. See the procedure “2.1.3 Check the Windows Firewall settings.” or “2.1.8 Check any third-party firewall settings”.



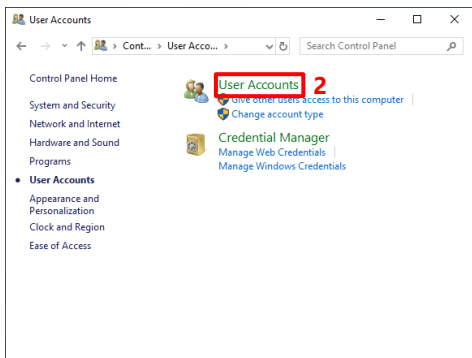
4. If strings are displayed as shown in the left picture, the camera is not connected to PC. Refer to the procedure “2.1.1 Check that the camera’s LINK LED lights up” or check the IP address described in the procedure “2.1.2 Check the IP address on the PC”.

2.1.6. Check the [User Account Control] settings

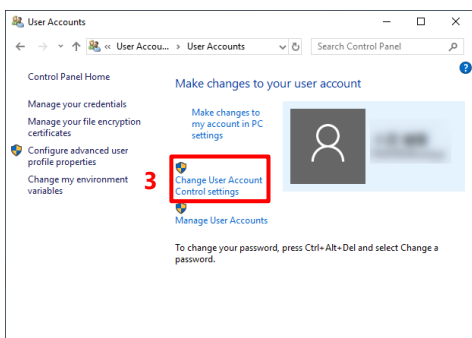
Some manufacturer's PCs are unable to properly connect unless the [User Account Control] feature is turned off. Use the following procedure to turn off the [User Account Control] feature.



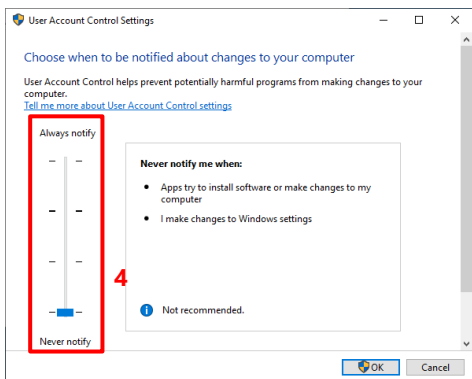
1. Press the [Win] key and [R] key, enter “control” and click the [OK] button to open the Command Prompt.



2. Click “User Accounts”.



3. Click “Change User Account Control settings”.



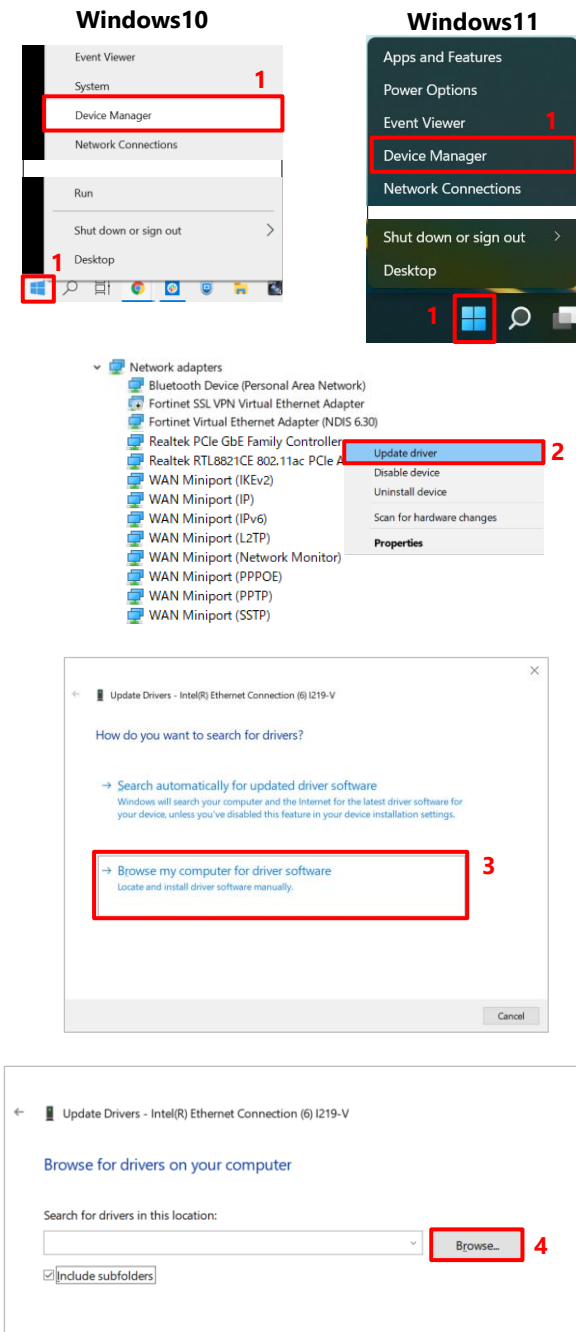
4. Move the left slider in the displayed window all the way to the bottom.

2.1.7. PC Network Card Driver Update

An old driver version may cause poor communication. If you are having trouble, please try updating the driver first. If the driver file is in the form of an installer, you can update it by running it.

The following is how to update a driver file without an installer.

In advance, download the driver file from your network card manufacturer's website.



1. Right-click the [Start menu] and click [Device Manager].
2. In the Device Manager window, under Network adapters, locate the network card you want to use and right-click and click [Update driver].
3. In the Update Drivers window, click "Browse my computer for driver software".
4. Click the [Browse] button to specify the location of the driver file and update the driver.

2.1.8. Check any third-party firewall settings

Communication between the camera and the PFV4 may be blocked by third-party firewalls. After checking the Windows Firewall settings with procedure “2.1.3 Check the Windows Firewall settings”, check the settings of any third-party firewalls. The procedure is subject to change depending upon the specification of each software. Contact the vendor, etc. for details.

2.1.9. Check the following points when using the FASTCAM SA-X2/SA-Z

Note the following points regarding the LAN connection and the IP address when using the Photron FASTCAM SA-X2/SA-Z high-speed camera. Check the following points in addition to procedures “2.1.1 Check that the camera’s LINK LED lights up” to “2.1.8 Check any third-party firewall settings”.

- The FASTCAM SA-X2/SA-Z includes two Gigabit Ethernet interface connectors. Note that the factory default for the IP address of “GIGABIT ETHER2” is set to “192.168.1.10”.
- Confirm the LAN connection interface. The connection may not work well or be unstable when connecting to the LAN with a PCI board, PCMCIA card, or USB-LAN unit.
- The FASTCAM SA-X2/SA-Z can connect using two LAN cables. For this reason, there are two IP addresses, but only one IP address should be specified for the PFV4 connection setting. If both IP addresses are specified, then they will be recognized as two separate cameras.

2.1.10. Precautions after confirming all the procedures

- Check that the NIC (LAN board) supports Gigabit Ethernet. Cards that only support 10/100 BASE-T (including 1000BASE-T for 10GbE connection) cannot connect. It is possible to route through a Gigabit Ether switching hub, but the communication will be slower.
- Check that you are not using a wireless LAN. The wireless LAN may be searched when searching the network, so try setting the wireless LAN to “Disable”.
- Check to see if the terminal that is set is different from the LAN terminal you are using. Be careful if there are two or more local area connections shown on the Windows network connections screen.
- In some cases, the camera’s IP address may have changed (the camera’s factory default IP address is “192.168.0.10”). In this case, initialize the IP address from the switch on the camera. For details, refer to the hardware manual of your camera.
- Connect the camera head when using the FASTCAM MC2 / MC2.1 / MH4 / MH6.
- When two or more cameras or PCs connect through a hub, the devices may have the same IP address and be unable to connect. Set a different IP address for each device.
- Confirm that the camera cable is Enhanced Category 5 or higher (for 10GbE connection: Category 7 or higher STP cable).



NOTE

If the issue is still unresolved after performing procedures 1 through 10, contact our engineer. Also inquire about any points that are unclear in each procedure.



A. Appendix

A1. FAQ

Q1. Is a driver required for Gigabit Ethernet interface, as is the case with IEEE1394 and optical interface systems?

No, it is not necessary to install any driver because communication takes place via the TCP/IP Ethernet connection.

Q2. What is "Jumbo Frame"?

A frame that is bigger than the standard maximum frame size of Ethernet (1,518 byte) is called a "Jumbo Frame" or "Jumbo Packet".

When a "Jumbo Frame" is activated, the maximum size of data to be sent at one time becomes bigger and the actual data transfer speed (throughput) is increased.

To use the Jumbo Frame function, all devices are required to be compatible with Jumbo Frame, not only the devices on both sides, which communicate each other, but also other network devices like the network hub.

Q3. What is the difference between simply selecting [Auto detection] and selecting [Select IP-address] to register each IP address on [IP-address dialog]?

There may be some difference in the startup time when starting up the PFV4 application. When [Auto Detection] is selected, the application looks for applicable camera systems by the IP address, which takes a little more time.

You can control only the specified camera(s), if there are several camera systems on the Network, if the IP address of each camera is registered.

On the other hand, if the network has a DHCP server in it, which assigns IP addresses for all devices in the network, the IP addresses assigned to cameras may be changed every time they are connected to the network, and the PC is required to be set in the [Auto detection] mode in advance to find the camera systems.

Q4. Is it possible to use the camera systems by connecting them to an existing 1000BASE-T network? Is it also possible to control the cameras in a WAN- connected network (e.g., controlling a camera remotely from other locations)?

It is technically possible, but we do NOT recommend it because of possible security issues involved. Note there is NO assurance of security.

We only recommend using the camera system in a closed network.


Contact our engineering manager regarding cases in which you connect multiple PCs and cameras.

Q5. How can multiple camera systems be connected to one PC?

Multiple cameras can be connected to one PC by splitting the cables through a hub and assigning a unique IP address to each camera. However, the hub must be 1000BASE-T compatible. In addition, if you wish to use the “Jumbo Frame” function, the hub must also be compatible with the function.

A2. Contacting Photron

For inquiries related to PFV, contact Photron at the contact information listed below. Additionally, the following items will be verified when inquiring, so prepare them in advance.

Items Verified	Example
Contact Information	Company name, school name, customer name, phone number, etc.
Product Name	<ul style="list-style-type: none"> Version number of Photron FASTCAM Viewer It can be checked from [MENU] - [About PFV] of the PFV menu bar. High speed camera name and firmware version From the LIVE mode tab, click the [ Edit] icon of a camera item in [Function panel] – [Camera controls] and the information can be checked from [Camera name] and [Firmware ver.] in the “Edit Camera Info” dialog.
Inquiry	Condition

Contact Information	
In Americas and Antipodes	PHOTRON USA, INC. 9520 Padgett Street, Suite 110, San Diego, CA 92126-4426, USA Phone: +1 (800) 585 2129 or +1 (858) 684 3555 Fax: +1 (858) 684 3558 E-mail: image@photron.com Web: www.photron.com
In UK, Africa and India	PHOTRON (EUROPE) LIMITED The Barn, Bottom Road, West Wycombe, Buckinghamshire HP14 4BS, U.K. Phone: +44 (0) 1494 48 1011 Fax: +44 (0) 1494 48 7011 E-mail: image@photron.com Web: www.photron.com
In Europe outside the UK	Photron Deutschland GmbH Ziegelweg 3, 72764 Reutlingen, Germany Phone: +49 (0) 7121 699 7950 Fax: +49 (0) 7121 699 7943 E-mail: image@photron.com Web: www.photron.com
In China	PHOTRON (SHANGHAI) LIMITED Room 20C Zhao-Feng World Trade Building, No. 369 Jiangsu Road Chang Ning District, Shanghai 200050, China Phone: +86 (21) 5268 3700 Fax: +86 (21) 5268 3702 E-mail: info@photron.cn Web: www.photron.cn
In other areas	PHOTRON LIMITED 21F, Jinbocho Mitsui Bldg., 1-105 Kanda Jimbocho, Chiyoda-Ku, Tokyo 101-0051, Japan Phone: 050-5211-8270 Fax: +81 (3) 3518 6279 E-mail: image@photron.co.jp Web: www.photron.co.jp

Gigabit Ethernet Interface

Connections Manual Rev. 4.09 E

Last Updated	August 2023
Written by	PHOTRON LIMITED 21F, Jinbocho Mitsui Bldg., 1-105 Kanda Jimbocho, Chiyoda-Ku, Tokyo 101-0051, Japan