

Automation Playback

## Camera Control Sample Programs



### INSTRUCTIONS



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# Introduction

This sample program manual (hereinafter referred to as this document) describes sample programs for operating AXIS Communications AB (hereinafter referred to as AXIS) network cameras (hereinafter referred to as the camera) from the Omron's Machine Automation Controller NX502-1□00.

## Intended Audience

This manual is intended for the following personnel, who must also have knowledge of electrical systems (an electrical engineer or the equivalent).

- Personnel in charge of introducing FA systems.
- Personnel in charge of designing FA systems.
- Personnel in charge of installing and maintaining FA systems.
- Personnel in charge of managing FA systems and facilities.

For programming, this manual is intended for personnel who understand the programming language specifications in international standard IEC 61131-3 or Japanese standard JIS B 3503.

## Precautions for Correct Use



### Precautions for Correct Use

The sample programs assume that you are using an Axis camera in a local network that is isolated from external networks. Please note that authentication information such as username and password to be registered will be included in the Sysmac Studio project without encryption. So, take the following precautionary measures.

- Do not use the username and password that are registered for the camera with the Controller or other devices.
- To protect against theft or leakage of your username and password registered for the camera, consider the following:
  - a) Set a password for your Sysmac Studio project and use the data protection feature. Reference the sample programs and describe the authentication information of the camera as a constant (literal). The initial value set in the variable is not encrypted by the data protection function.
  - b) Restrict access to the SD Memory Card to which project backups are saved and locations where backups are stored. Specifically, manage the media and entry and exit for access control.

## About This Sample Program

The sample programs assume that you are using an Axis camera in a local network that is isolated from external networks.

# Manual Structure

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## Special Information

Special information in this manual is classified as follows:



### Precautions for Safe Use

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Precautions on what to do and what not to do to ensure safe usage of the product.



### Precautions for Correct Use

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Precautions on what to do and what not to do to ensure proper operation and performance.



### Additional Information

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Additional information to read as required.

This information is provided to increase understanding and make operation easier.



### Version Information

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Information on differences in specifications and functionality is given for the following items.

- Controllers
- Sysmac Studio
- Axis cameras

# CONTENTS

---

<b>Introduction .....</b>	<b>1</b>
Intended Audience .....	1
Precautions for Correct Use .....	1
About This Sample Program.....	1
<b>Manual Structure.....</b>	<b>2</b>
Special Information .....	2
<b>Terms and Conditions Agreement.....</b>	<b>6</b>
Warranty, Limitations of Liability .....	6
Application Considerations .....	7
Disclaimers .....	7
Statement of security responsibilities for assumed use cases and against threats .....	8
<b>Related Documents .....</b>	<b>9</b>
<b>Revision History.....</b>	<b>10</b>

## Section 1     About Sample Programs

---

<b>1-1   Overview of Sample Programs .....</b>	<b>1-2</b>
<b>1-2   About Included Files.....</b>	<b>1-3</b>
<b>1-3   Sample Ver.2 Program List.....</b>	<b>1-4</b>
1-3-1   Project file name .....	1-4
1-3-2   Overview .....	1-4
1-3-3   Program POU.....	1-5
1-3-4   Function POU.....	1-5
1-3-5   Function Block POU.....	1-6
1-3-6   Data Types .....	1-6
1-3-7   Global Variable .....	1-7
<b>1-4   Sample Ver.1 Program List.....</b>	<b>1-8</b>
1-4-1   Project file name .....	1-8
1-4-2   Overview .....	1-8
1-4-3   Program POU.....	1-9
1-4-4   Function POU.....	1-9
1-4-5   Function Block POU.....	1-9

## Section 2     System Configuration and Usage Procedures

---

<b>2-1   System Configuration.....</b>	<b>2-2</b>
<b>2-2   Confirmed with Sample Ver.2 Camera .....</b>	<b>2-4</b>
<b>2-3   Application Procedures.....</b>	<b>2-6</b>

## Section 3     Camera Settings

---

<b>3-1   Setting the Camera .....</b>	<b>3-2</b>
<b>3-2   Initial Setting of Cameras.....</b>	<b>3-3</b>
<b>3-3   Clock Time Setting.....</b>	<b>3-10</b>
<b>3-4   Setting the Storage of Video Files.....</b>	<b>3-11</b>

<b>3-5</b>	<b>Configuring Virtual Input.....</b>	<b>3-15</b>
3-5-1	Setting Stream Profile .....	3-15
3-5-2	Configuring Recording Rules and Assigning Virtual Input.....	3-18
<b>3-6</b>	<b>Restarting the Camera and Checking the Settings .....</b>	<b>3-22</b>

## Section 4 Sample Ver.2 Usage

<b>4-1</b>	<b>Security Information .....</b>	<b>4-2</b>
<b>4-2</b>	<b>UpdateCameraTime .....</b>	<b>4-3</b>
4-2-1	Function .....	4-3
4-2-2	How to Use This Sample Program .....	4-3
4-2-3	Setting example .....	4-3
4-2-4	Specifications of Function block SetCameraTimeFromController .....	4-4
<b>4-3</b>	<b>PrePostTriggerRecording .....</b>	<b>4-7</b>
4-3-1	Function .....	4-7
4-3-2	How to Use This Sample Program .....	4-7
4-3-3	Setting example .....	4-8
4-3-4	Specification of function block ExecCameraRecording .....	4-8
<b>4-4</b>	<b>StartStopTriggerRecording .....</b>	<b>4-11</b>
4-4-1	Function .....	4-11
4-4-2	How to Use This Sample Program .....	4-11
4-4-3	Setting example .....	4-12
4-4-4	Function block ExecCameraRecording specification .....	4-12
<b>4-5</b>	<b>Timing Charts .....</b>	<b>4-13</b>
<b>4-6</b>	<b>Troubleshooting .....</b>	<b>4-14</b>
<b>4-7</b>	<b>Error Codes .....</b>	<b>4-16</b>

## Section 5 Controller Settings

<b>5-1</b>	<b>Secure Socket Configuration Procedure .....</b>	<b>5-2</b>
5-1-1	If you do not use a client certificate and a client private key .....	5-3
5-1-2	If you use a client certificate and a client private key .....	5-4
<b>5-2</b>	<b>Using Sample Programs .....</b>	<b>5-6</b>
5-2-1	Assigning Program POU to Task .....	5-6
5-2-2	Establishment of Trigger Conditions and Saving Video .....	5-8

## Section 6 Playing Back Variable Logs and Videos

<b>6-1</b>	<b>How to Start and Stop Playback .....</b>	<b>6-2</b>
6-1-1	Preparing Variable log .....	6-2
6-1-2	Procedure for Starting Playback .....	6-3
6-1-3	Procedure for Ending the Playback .....	6-4
<b>6-2</b>	<b>Troubleshooting When a Video Cannot be Played Back .....</b>	<b>6-5</b>

## Sample Ver.1 Detailed Description

<b>A1-1</b>	<b>System Configuration .....</b>	<b>A1-2</b>
<b>A1-2</b>	<b>Confirmed with Sample Ver.1 Camera .....</b>	<b>A1-4</b>
<b>A1-3</b>	<b>Application Procedures .....</b>	<b>A1-5</b>
<b>A1-4</b>	<b>How to Use Sample Programs .....</b>	<b>A1-6</b>
A1-4-1	Security Information .....	A1-6

A1-4-2	UpdateCameraTime .....	A1-6
A1-4-3	UpdateCameraTime2 .....	A1-9
A1-4-4	PrePostTriggerRecording .....	A1-12
A1-4-5	TriggeredIntervalRecording .....	A1-16
A1-4-6	Timing Charts .....	A1-19
A1-4-7	Troubleshooting .....	A1-20
A1-4-8	Error Codes .....	A1-21

## Setting Examples

---

<b>A2-1</b>	<b>Example of Settings for Camera OS Version 8.40.8 (M5525-E) .....</b>	<b>A2-2</b>
A2-1-1	Initial Setting of Cameras .....	A2-2
A2-1-2	Clock Time Setting .....	A2-5
A2-1-3	Setting the Storage of Video Files .....	A2-6
A2-1-4	Configuring Virtual Input .....	A2-8
A2-1-5	Restarting the Camera and Checking the Settings .....	A2-14
<b>A2-2</b>	<b>Example of Video Recording Settings with a High Frame Rate .....</b>	<b>A2-15</b>
<b>A2-3</b>	<b>Examples of Computer Settings .....</b>	<b>A2-18</b>
A2-3-1	Example of Setting to Use a Computer as Network Storage .....	A2-18
A2-3-2	Example of Changing IP Address of a Computer .....	A2-27

## Communications between the Camera and Controller

---

<b>A3-1</b>	<b>About Digest Authentication .....</b>	<b>A3-2</b>
<b>A3-2</b>	<b>List of VAPIX Commands Used in the Sample Program .....</b>	<b>A3-3</b>
A3-2-1	Sample Ver.2 .....	A3-3
A3-2-2	Sample Ver.2 .....	A3-3
<b>A3-3</b>	<b>Virtual Input .....</b>	<b>A3-4</b>

## Tips

---

<b>A4-1</b>	<b>Check Items When Using Untested Cameras .....</b>	<b>A4-2</b>
-------------	--	-------------

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# Related Documents

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The following are the documents related to this document. Use these documents for reference.

Cat. No.	Document name
W631	Playback data Collection system Environment construction procedures for Buffalo NAS
W632	Playback data Collection system Environment construction procedures for Synology NAS
W639	NX-series CPU Unit Automation Playback User's Manual
W503	NJ/NX-series Troubleshooting Manual
W504	Sysmac Studio Version 1 Operation Manual
W506	NJ/NX-series CPU Unit Built-in EtherNet/IP Port User's Manual

# Revision History

A document revision code appears as a suffix to the catalog number on the front and back covers of the document.

Cat. No.

W641-E1-03

Revision code

Revision code	Date	Revised content
01	July 2023	Original production
02	May 2024	<ul style="list-style-type: none"><li>Added camera models that have been confirmed to work.</li><li>Reviewed the manual configuration and added and modified the content.</li><li>Corrected mistakes.</li></ul>
03	April 2025	Updated with the addition of sample program Ver.2.0

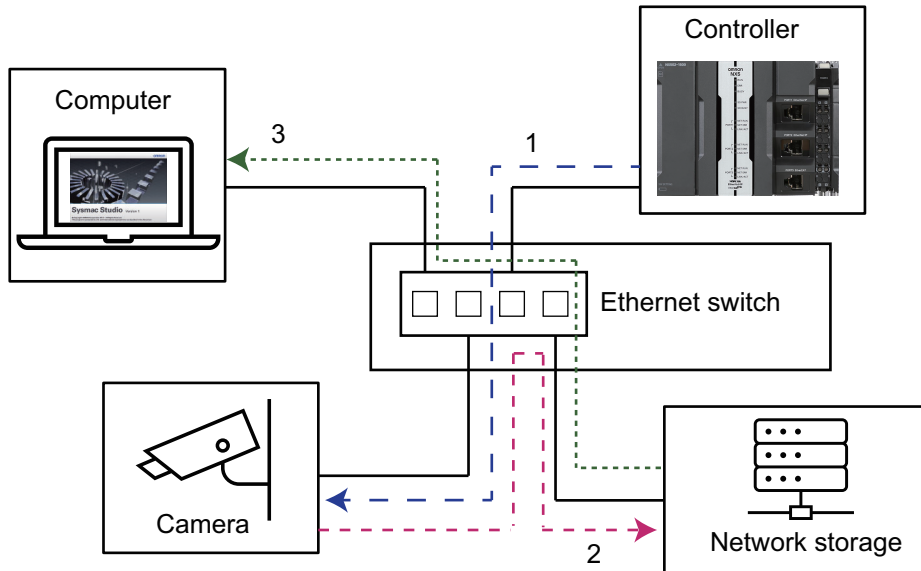
# About Sample Programs

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<b>1-1</b>	<b>Overview of Sample Programs .....</b>	<b>1-2</b>
<b>1-2</b>	<b>About Included Files .....</b>	<b>1-3</b>
<b>1-3</b>	<b>Sample Ver.2 Program List.....</b>	<b>1-4</b>
1-3-1	Project file name.....	1-4
1-3-2	Overview .....	1-4
1-3-3	Program POUs .....	1-5
1-3-4	Function POUs .....	1-5
1-3-5	Function Block POUs .....	1-6
1-3-6	Data Types .....	1-6
1-3-7	Global Variable .....	1-7
<b>1-4</b>	<b>Sample Ver.1 Program List.....</b>	<b>1-8</b>
1-4-1	Project file name.....	1-8
1-4-2	Overview .....	1-8
1-4-3	Program POUs .....	1-9
1-4-4	Function POUs .....	1-9
1-4-5	Function Block POUs .....	1-9

# 1-1 Overview of Sample Programs

Use our sample programs to build a video recording system with an Axis camera connected to the Controller. Each device functions as follows in the system.



- 1** The Controller turns ON the recording trigger of the camera.  
The Controller issues camera control commands and controls the camera using socket communications.
- 2** The camera saves video files to the network storage.  
You need to configure the camera settings to record video files.
- 3** The video file can be played on Sysmac Studio.

By using our sample programs and controlling the camera's virtual input with the trigger of the automation playback function, you can record video files that can be linked with variable logs in the order of seconds.



## Additional Information

The sample programs in this document use VAPIX commands for Axis cameras as camera control commands. Refer to *A3-2 List of VAPIX Commands Used in the Sample Program* on page A3-3 for information on those commands.

# 1-2 About Included Files

The following files are included in the sample program Sample\_apb\_camera\_control\_EN\_2.0.zip.

File names	Description Names in this document	Overview	Renewal time
Sample_apb_camera_control_EN_2.0.smc2	Sample Ver.2	This project file contains sample programs that support HTTP, HTTPS, Basic, and Digest authentication. If you are creating a new program, please use this.	April 2025
Sample_apb_camera_control_EN_1.1.smc2	Sample Ver.2	This project file contains sample programs that support HTTP and Digest authentication. This is a sample published in the past.	June 2024
W641-E1-03.pdf	This manual	This is the instruction manual for the sample program.	April 2025

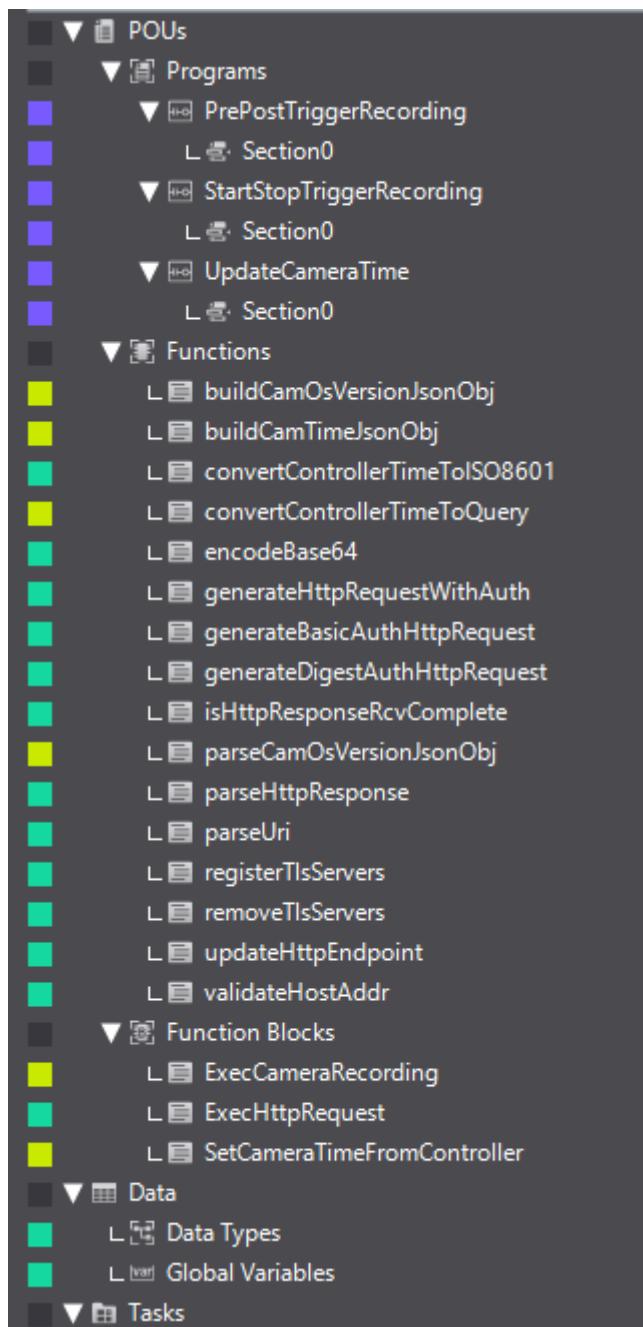
## 1-3 Sample Ver.2 Program List

### 1-3-1 Project file name

Sample\_apb\_camera\_control\_EN\_2.0.smc2

### 1-3-2 Overview

The sample programs are provided in one project. The project includes the following POUs.



POUs, data types, and global variables are classified by the following color codes.



Color code	Classification	Dependency
blue	An acronym for function block.	Operation of the POU depends on the color code being yellow.
yellow	Functions and function blocks for controlling Axis cameras	Operation of the POU depends on the color code being yellow.
green	Functions and Function Blocks for HTTP Communication	-

These POUs are also used in conjunction with the data types and global variables described below.



#### Precautions for Correct Use

Omron provides the sample programs but does not guarantee communications with all camera products from Axis. Check if they work as expected before using them for an actual system. If you modify a sample program, such as using it to communicate with cameras from other manufacturers, confirm the behavior thoroughly.



#### Additional Information

With only this project file, you can check the behavior of collecting variable log using the automation playback (function) and recording videos linked to trigger.



#### Additional Information

The sample program assumes that the following peripheral devices have already been launched when the Controller starts its operation.

- Cameras
- Network storage



#### Additional Information

The color code can be used as a filter in the Filter Pane of Sysmac Studio. Refer to *Sysmac Studio Version 1 Operation Manual (Cat. No. W504)* for details on Filter Pane.

### 1-3-3 Program POUs

You can assign these POUs to tasks.

POU name	Description
PrePostTriggerRecording	This program records the video for the <b>Pre/Post trigger</b> method.
StartStopTriggerRecording	This program records the video for the <b>Start/Save trigger</b> method.
UpdateCameraTime	This FB sets the clock time information of the Controller to the camera.

### 1-3-4 Function POUs

These POUs create messages to be sent to the camera and analyze received messages. These are used in function block POUs.

POU name	Description
buildCamOsVersionJsonObj	Constructs a JSON object string to read the version of an Axis camera's OS.

POU name	Description
buildCamTimeJsonObj	Constructs a JSON object string to set the date and time on an Axis camera. It including the current UTC time based on controller in ISO 8601 format.
convertControllerTimeToISO8601	Convert the current controller time (year, month, day, hour, minute, second) into a query to set the time on an Axis camera.
encodeBase64	Encodes an input string into BASE64 format.
generateHttpRequestWithAuth	Selects the appropriate authentication scheme (Basic or Digest) and generates the corresponding HTTP request by calling the respective function.
generateBasicAuthHttpRequest	Generates an HTTP request with Basic authentication, including the construction of the request headers and body.
generateDigestAuthHttpRequest	Generates an HTTP request with Digest authentication, including the calculation of the digest hash and the construction of the request headers and body.
isHttpResponseRcvComplete	Check if the HTTP response has been completely received.
parseCamOsVersionJsonObj	Extracts the major and minor version of Axis camera OS from an HTTP response string.
parseHttpResponse	Parses an HTTP response, handles redirects and authentication challenges, and extracts necessary parameters for Digest authentication.
parseUri	Detects the port number, host address, and path from a given URI, and determines if the connection is secure (HTTPS) or not (HTTP).
registerTlsServers	Registers the host IP address in an empty element of the Tls server management array.
removeTlsServers	Searches for the host IP address in the Tls server management array and remove if found.
updateHttpEndpoint	Updates the endpoint if the current HTTP session can be reused by checking if the host address, port number, and HTTP scheme of the next URI match the current ones.
validateHostAddr	Validates whether the given host is in a valid IP address

### 1-3-5 Function Block POUs

These POUs are used for standard interactions with Axis cameras. They are used in program POUs.

POU name	Description
ExecCameraRecording	Control recording through the virtual input port of Axis cameras.
ExecHttpRequest	This function block sends requests and receives responses via HTTP/HTTPS.
SetCameraTimeFromController	Set the time information of the Axis camera to match the time information of the controller.

### 1-3-6 Data Types

Structures and enumerations used in function blocks. If you want to use this sample program for another project, please use these as well.

Classification	Name	Overview
Structure	sHTTP_DigestParams	Parameters required for Digest authentication
	sHTTP_RespFields	Structure to store HTTP response fields

Classification	Name	Overview
Enumerations	eHTTP_AuthScheme	Definition Authentication Schemes
	eHTTP_ReqStage	Stages of processing HTTP communication
	eCAM_ControlProcess	Control procedures for Axis cameras

### 1-3-7 Global Variable

Automation playback Trigger Variable and variables used in function blocks. If you want to use this sample program for another project, please use these as well.

Name	Overview
G_DigestNC	Digest authentication nonce count
G_TlsServers	Servers that have established a secure session
PrePostTrigger*1	Trigger of the <b>Pre/Post trigger</b> method
StartTrigger*1	Start trigger of the <b>Start/Save trigger</b> method
SaveTrigger*1	Save trigger of the <b>Start/Save trigger</b> method

\*1. If you do not want to divert the program POU to another project, you do not need to divert it.

# 1-4 Sample Ver.1 Program List



## Version Information

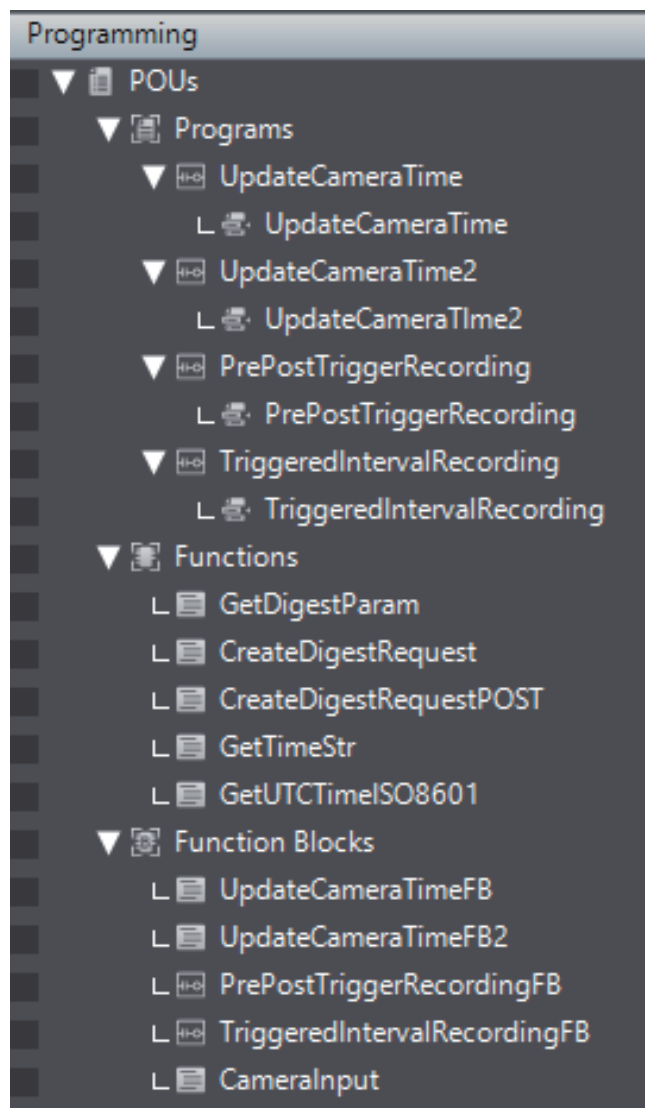
For a detailed explanation of sample Ver. 1, see *Sample Ver.1 Detailed Description* on page A1-1.

### 1-4-1 Project file name

Sample\_apb\_camera\_control\_EN\_1.1.smc2

### 1-4-2 Overview

The sample programs are provided in one project. The project includes the following POU's.



**Precautions for Correct Use**

Omron provides the sample programs but does not guarantee communications with all camera products from Axis. Check if they work as expected before using them for an actual system. If you modify a sample program, such as using it to communicate with cameras from other manufacturers, confirm the behavior thoroughly.

**Additional Information**

With only this project file, you can check the behavior of collecting variable log using the automation playback (function) and recording videos linked to trigger.

**Additional Information**

The sample program assumes that the following peripheral devices have already been launched when the Controller starts its operation.

- Cameras
- Network storage

**1-4-3 Program POU**

You can assign these POU to tasks. Select an appropriate one depending on the OS version of your camera.

POU name	Description
UpdateCameraTime	This program sets the clock time information of the Controller to the camera. It is assumed to be used with cameras with OS version 10.x or earlier.
UpdateCameraTime2	This program sets the clock time information of the Controller to the camera. It is assumed to be used with cameras with OS version 11.x or later.
PrePostTriggerRecording	This program records the video for the <b>Pre/Post trigger</b> method.
TriggeredIntervalRecording	This program records the video for the <b>Start/Save trigger</b> method.

**1-4-4 Function POU**

These POU create messages to be sent to the camera and analyze received messages. These are used in function block POU.

POU name	Description
GetDigestParam	This function extracts Digest authentication parameters.
CreateDigestRequest	This function creates a request message for Digest authentication using the GET method.
CreateDigestRequest-POST	This function creates a request message for Digest authentication using the POST method.
GetTimeStr	This function gets the current clock time of the Controller in string format.
GetTimeStrISO8601	This function gets the current clock time of the Controller in ISO8601 format.

**1-4-5 Function Block POU**

These POU are used for standard interactions with Axis cameras. They are used in program POU.

POU name	Description
UpdateCameraTimeFB	This function block sets the clock time information of the Controller to the camera.
UpdateCameraTimeFB2	This function block sets the clock time information of the Controller to the camera.
PrePostTriggerRecordingFB	This function block records the video for the <b>Pre/Post trigger</b> method of automation playback.
TriggeredIntervalRecordingFB	This function block records video for the <b>Start/Save trigger</b> method of automation playback.
CameraInput	This function block turns ON or OFF the virtual input of the camera.

# 2

## System Configuration and Usage Procedures

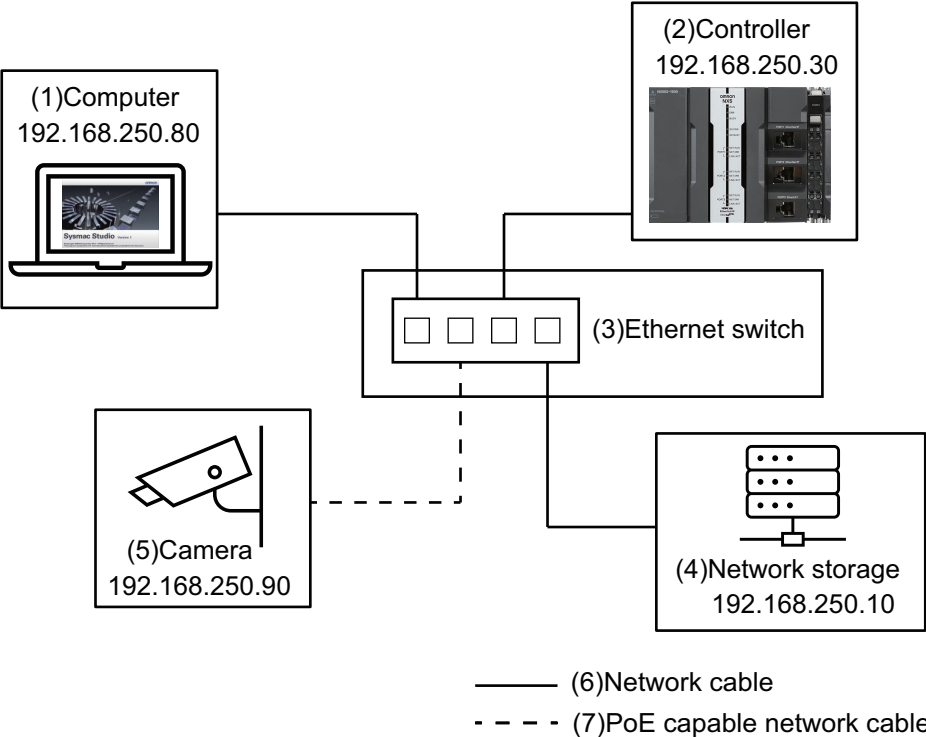
2

---

2-1	System Configuration .....	2-2
2-2	Confirmed with Sample Ver.2 Camera.....	2-4
2-3	Application Procedures .....	2-6

# 2-1 System Configuration

Omron has confirmed operation of the sample programs in the following system configuration.



No	Device	Description	IP address														
(1)	Computer	A computer with Sysmac Studio (version 1.55) installed	192.168.250.80														
(2)	Controller	<div><div>NX502-1□00 (Unit version 1.63)</div><div>This document assumes that the following automation playback settings have been set in the Controller.</div><div><b>Sampling Setting 1</b></div><table><tr><th>Item</th><th>Setting</th></tr><tr><td>Trigger method</td><td>Pre/Post trigger method</td></tr><tr><td>Pre-trigger sampling time</td><td>20 seconds</td></tr><tr><td>Post-trigger sampling time</td><td>10 seconds</td></tr></table><div><b>Sampling Setting 2</b></div><table><tr><th>Item</th><th>Setting</th></tr><tr><td>Trigger method</td><td>Start/Save trigger method</td></tr><tr><td>Sampling time</td><td>10 seconds</td></tr></table></div>	Item	Setting	Trigger method	Pre/Post trigger method	Pre-trigger sampling time	20 seconds	Post-trigger sampling time	10 seconds	Item	Setting	Trigger method	Start/Save trigger method	Sampling time	10 seconds	192.168.250.30
Item	Setting																
Trigger method	Pre/Post trigger method																
Pre-trigger sampling time	20 seconds																
Post-trigger sampling time	10 seconds																
Item	Setting																
Trigger method	Start/Save trigger method																
Sampling time	10 seconds																
(3)	Ethernet switch	<div>An Ethernet switch supporting PoE is used.</div> <div>Use one that can supply sufficient power to the camera. On some Ethernet switches, some ports can supply power by PoE and some cannot.</div>	---														



No	Device	Description	IP address								
(4)	Network storage	<div>A storage for saving video files. It is connected to the camera via SMB protocols. This manual assumes that the following settings have been set.</div> <table><tr><th>Item</th><th>Setting</th></tr><tr><td>The storage folder name of video files</td><td>apb_tmp</td></tr><tr><td>User</td><td>APB</td></tr><tr><td>Password</td><td>password</td></tr></table>	Item	Setting	The storage folder name of video files	apb_tmp	User	APB	Password	password	192.168.250.10
Item	Setting										
The storage folder name of video files	apb_tmp										
User	APB										
Password	password										
(5)	Cameras	<div>Network cameras made by Axis. This manual assumes that the following settings have been set.</div> <table><tr><th>Item</th><th>Setting</th></tr><tr><td>User</td><td>root</td></tr><tr><td>Password</td><td>password</td></tr></table>	Item	Setting	User	root	Password	password	192.168.250.90		
Item	Setting										
User	root										
Password	password										
(6)	Network cables	Use Ethernet cables that can be used with the device to be connected.	---								
(7)	PoE compatible network cable	<div>Prepare a PoE-compatible network cable. It can be used for both communications and power supply. Connect this cable to the camera and a port of the Ethernet switch that can supply power by PoE.</div>	---								



#### Precautions for Correct Use

Specify the network storage as the camera's video file output destination. If a video file is output to the camera's SD card, the video file cannot be played on Sysmac Studio.



#### Additional Information

This manual provides a setting example for using a computer as a network storage device. Refer to *A2-3-1 Example of Setting to Use a Computer as Network Storage* on page A2-18 for the setting example.



#### Version Information

Axis camera OS version 12 or later, Axis cameras in the factory default settings are configured to accept only HTTPS communication, with HTTP communication disabled. Consider using Sample Ver. 2 of this sample program.

## 2-2 Confirmed with Sample Ver.2 Camera

The sample programs have been confirmed to work correctly with the following cameras. Omron does not guarantee the operation of those cameras.

Model	OS version	Type	Maximum resolution	Maximum fps
AXIS M3125-LVE	12.3.56	Dome	1920x1080	50/60
AXIS M4216-LV	12.2.62		2304x1728	25/30
AXIS P3265-LVE	12.2.62		1920x1080	50/60
AXIS Q3536-LVE	12.2.62		2688x1512	50/60
AXIS M3085-V	11.4.63		1920 x 1080	25/30
	12.6.62			
AXIS M3086-V	11.4.63		2688 x 1512	25/30
AXIS M3088-V	11.9.60		3840 x 2160	12/15
AXIS M3115-LVE	10.12.166		1920 x 1080	25/30
AXIS M5000-G	12.2.52	PTZ	1920x1080	25/30
AXIS M5074	12.2.52		1280x720	50/60
AXIS M5526-E	12.3.56		2688x1512	50/60
AXIS Q6135-LE	12.3.56		1920x1080	50/60
AXIS V5925	12.3.56		1920x1080	50/60
AXIS M5075-G	11.4.63		1920 x 1080	50/60
AXIS M5525-E	8.40.19		1920 x 1080	25/30
AXIS P1245 MK II	12.2.52	Modular	1920x1080	25/30
AXIS P1265 MK II	12.2.52		1920x1080	25/30
AXIS P1275 MK II	12.2.52		1920x1080	25/30
AXIS P1280-E	9.80.95		208x156	8.3
AXIS P1290-E	9.80.95		208x156	8.3
AXIS P1245	9.80.28		1920 x 1080	25/30
AXIS P1275	9.80.28		1920 x 1080	25/30
AXIS FA1105 + AXIS FA54	11.9.60		1920 x 1080	25/30
AXIS F2105-RE + AXIS F9111	11.9.60		1920 x 1080	180
AXIS F2115-R + AXIS F9111	11.9.60		1920 x 1080	180
AXIS M1055-L	12.2.62	Box	1920x1080	25/30
AXIS M1075-L	12.2.62		1920x1080	25/30
AXIS M1135 Mk II	12.2.52		1920x1080	25/30
AXIS P1385	12.2.62		1920x1080	50/60
AXIS P1387-B	12.3.56		2592x1944	50/60
AXIS P1388	12.2.62		3840x2160	50/60
AXIS P1375	10.12.166		1920 x 1080	50/60
	11.4.63			
AXIS P1378	11.9.60		3840 x 2160	25/30
AXIS Q1715	11.9.60		1920 x 1080	120
AXIS M4308-PLE	12.3.56	Panoramic	2880x2880	25/30
AXIS P3818-PVE	11.9.60		5120 x 2560	30
AXIS Q3819-PVE	11.7.61		4096 x 864*1	30

Model	OS version	Type	Maximum resolution	Maximum fps
AXIS M2035-LE	12.2.62	Bullet type	1920x1080	25/30
AXIS M2036-LE	12.2.62		2688x1512	25/30
AXIS P1455-LE	11.11.135		1920x1080	50/60
AXIS Q1805-LE	12.2.62		1920x1080	90

\*1. Sysmac Studio cannot play videos shot at the resolution of 8192 x 1728 supported by this camera.



#### Additional Information

- When you use an Axis camera that is not listed here, please refer to *A4-1 Check Items When Using Untested Cameras* on page A4-2 and test the behavior of the sample programs.
- The sample programs in this document can only control Axis cameras. To use a camera from other manufacturers, check the interfaces supported by the camera, and create your camera control programs.

## 2-3 Application Procedures

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Use the sample programs to record a video file for variable logs and use it for playback.

- 1** Set up the camera.  
Refer to *Section 3 Camera Settings* on page 3-1 and configure the camera so that it can be controlled by the sample program.
- 2** Configure the sample program.  
Refer to *Section 4 Sample Ver.2 Usage* on page 4-1 and configure the sample program so that it can be used on your system.
- 3** Start up the peripheral devices.  
This sample program assumes that the Controller is started after the camera and network storage are booted.
- 4** Start the operation of the Controller.  
Refer to *Section 5 Controller Settings* on page 5-1 and configure the Controller so that the user program, including the sample program, is executed.  
When the trigger condition is met, the automation playback function outputs a variable log, and the camera outputs a video file to the network storage.
- 5** Playback on Sysmac Studio.  
Refer to *Section 6 Playing Back Variable Logs and Videos* on page 6-1 and start playback using variable logs and a video file.

With the above procedure, you can play the playback data in which variables and the video are linked.

# 3

## Camera Settings

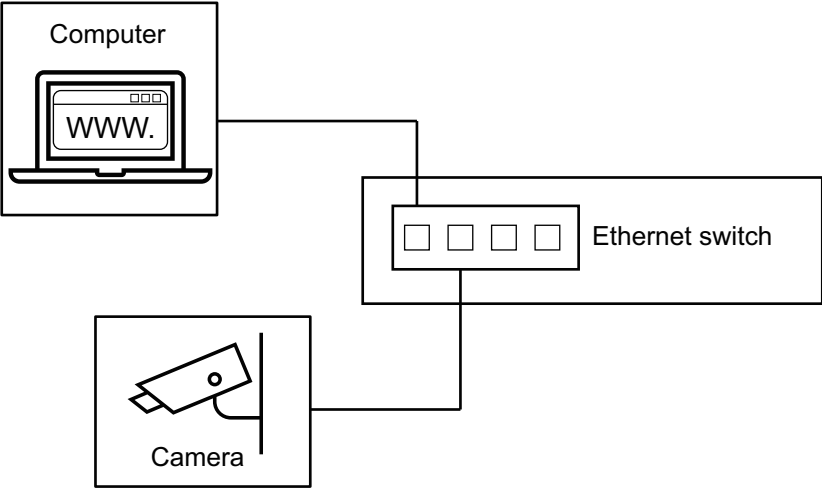
3

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<b>3-1</b>	<b>Setting the Camera .....</b>	<b>3-2</b>
<b>3-2</b>	<b>Initial Setting of Cameras .....</b>	<b>3-3</b>
<b>3-3</b>	<b>Clock Time Setting .....</b>	<b>3-10</b>
<b>3-4</b>	<b>Setting the Storage of Video Files .....</b>	<b>3-11</b>
<b>3-5</b>	<b>Configuring Virtual Input .....</b>	<b>3-15</b>
3-5-1	Setting Stream Profile .....	3-15
3-5-2	Configuring Recording Rules and Assigning Virtual Input.....	3-18
<b>3-6</b>	<b>Restarting the Camera and Checking the Settings.....</b>	<b>3-22</b>

# 3-1 Setting the Camera

To use the sample programs, the camera must be configured in advance. Use the web browser on your computer to set up the camera.



This section describes how to set up the following camera model as an example.

OS version	Camera model
11.4.63	AXIS M3085-V



## Additional Information

- Depending on the camera model and OS version you are using, the setting items may differ. For details on how to update the firmware and how to set it according to the version, refer to the manual of your camera.
- This manual provides setting examples for using other camera models, too. Please refer to those sections as you need.

OS ver- sion	Contents	Camera model	Reference
8.40.19	General camera set- tings	AXIS M5525-E	A2-1 Example of Settings for Camera OS Version 8.40.8 (M5525-E) on page A2-2
11.9.60	How to set up high frame rate video re- cording	AXIS F2105-RE + AXIS F9111	A2-2 Example of Video Recording Set- tings with a High Frame Rate on page A2-15
		AXIS F2115-R + AX- IS F9111	

# 3-2 Initial Setting of Cameras

Use your computer's web browser to set up the camera. When starting up the camera for the first time, registration of user information and network settings such as an IP address are required. After the configuration, you can access the camera with user name and password.  
This section gives an example of how to set up the camera using Microsoft Edge.

- 1
- Set the IP address of the computer to have the same network address as the camera, which is the initial IP address of the camera to be connected.



## Version Information

The camera's default IP Address varies depending on the camera's OS version. Please set the network settings of your computer according to the OS version of the camera within the range in the table below.

Camera's OS version	Camera's default IP Address	Examples of Computer Settings	
		IP address	Subnet mask
12.0 or higher	169.254.x.x	169.254.0.1	255.255.0.0
11.11 or lower	192.168.0.90 - 192.168.0.95	192.168.0.80	255.255.255.0

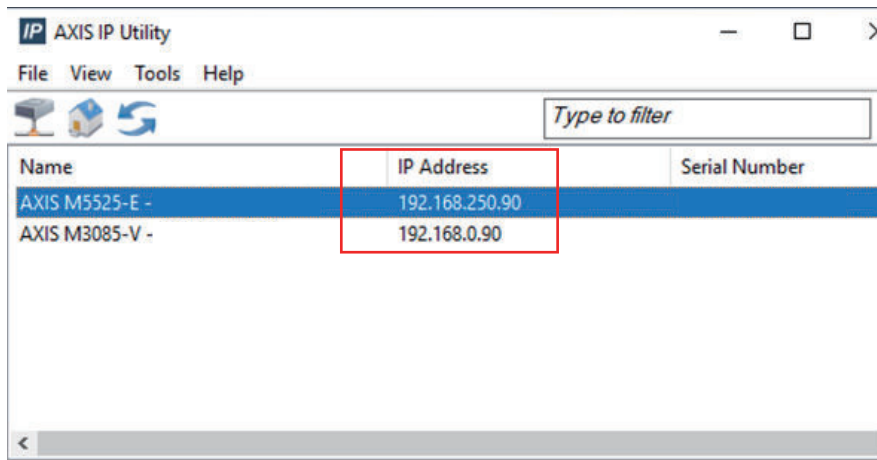
In this example, the camera's OS version is 11.4.63, and the computer's network settings will be as shown in the table below.

IP address	Subnet mask
192.168.0.80	255.255.255.0

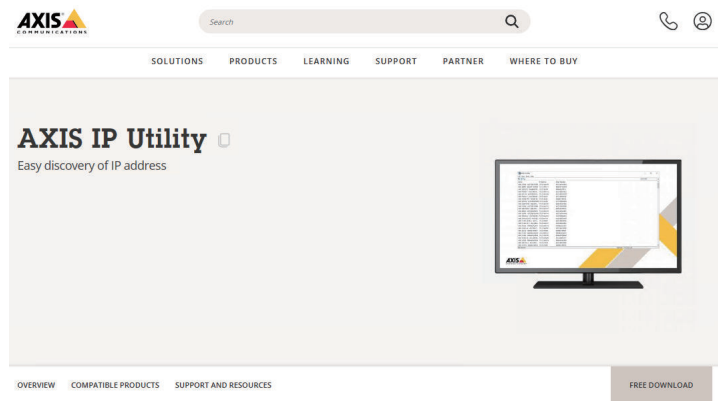


### Additional Information

- You can check the IP address of an Axis camera by using "AXIS IP Utility".



- You can download "AXIS IP Utility" from [www.axis.com](http://www.axis.com).

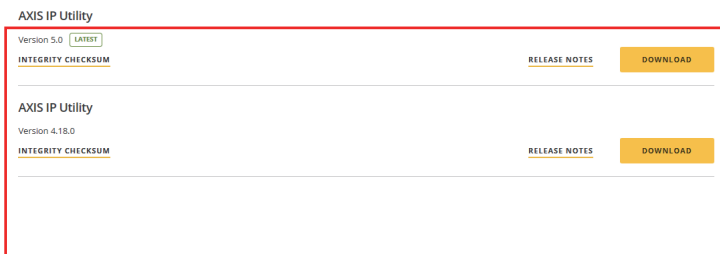


AXIS IP Utility helps you set the IP address of an Axis network video product. Axis devices on the network are automatically discovered and displayed. Assign network parameters (IP Address, Subnet mask and Default router) or configure the device to obtain its IP address from DHCP. AXIS IP Utility's user interface is available in English, French, German, Italian, Japanese and Spanish.

The Axis device and the client computer must be on the same subnet/network segment.

[HOW TO FIND THE SERIAL NUMBER](#)

Free download



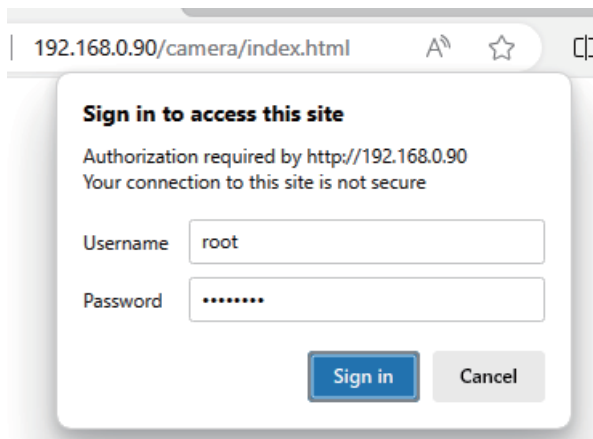
- For an example of how to change the IP address of a computer, refer to *A2-3-2 Example of Changing IP Address of a Computer* on page A2-27.

- Enter the IP address of the camera in the browser.  
In this example, enter 192.168.0.90.

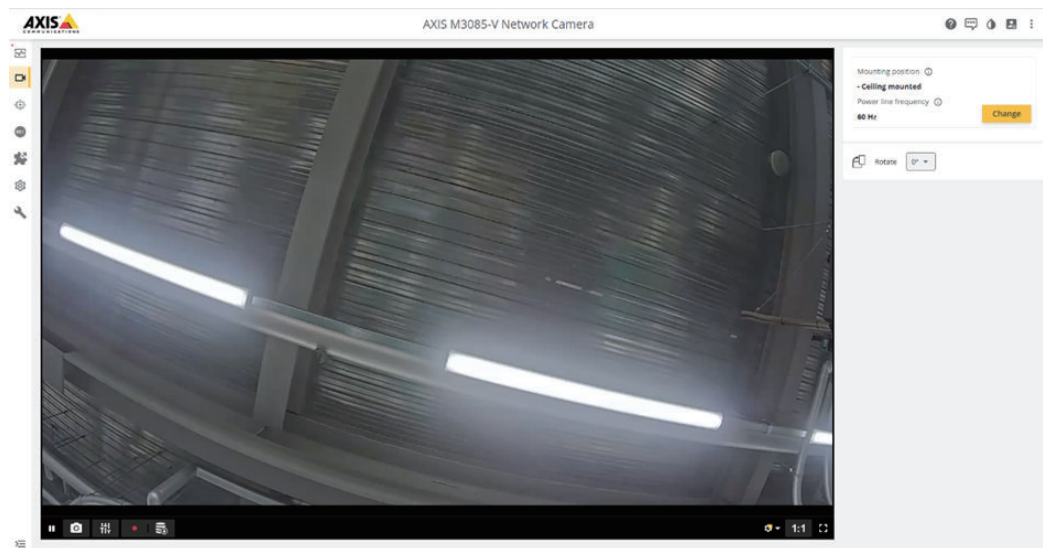


- 3** Enter the password you want to set for the root account and click the **Add user** button. There are two input fields for the password. Type the password for the root account in each of the two input fields, confirm the camera's user license agreement, and select the **I accept the end user license agreement** check box. Then, click the **Add user** button.

- 4** Log into the camera with the root account. Enter "root" as the **Username** and the **Password** you set in the previous step, and then click the **Sign in** button.



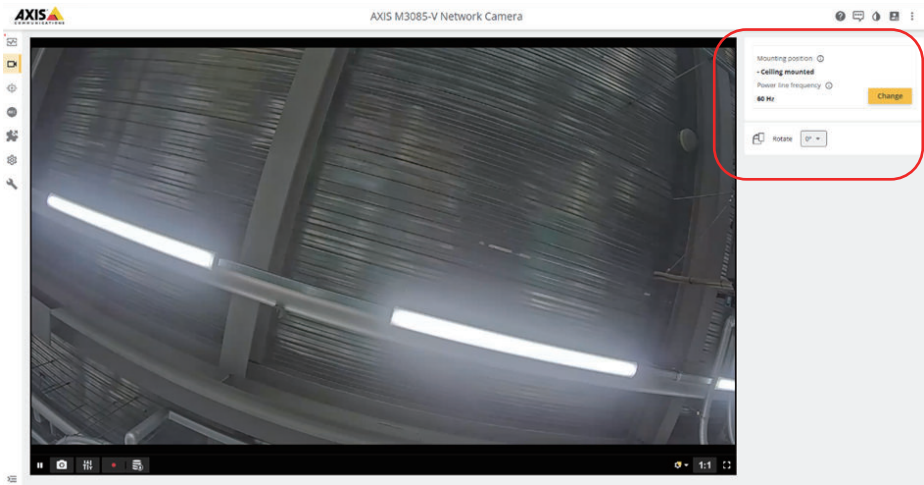
The Live View window is displayed when you log into the camera.



#### Additional Information

After setting a root account password, the camera's Live View window may be displayed without entering a username and password.

- 5 Configure **Mounting position** and **Power line frequency** according to the usage environment.

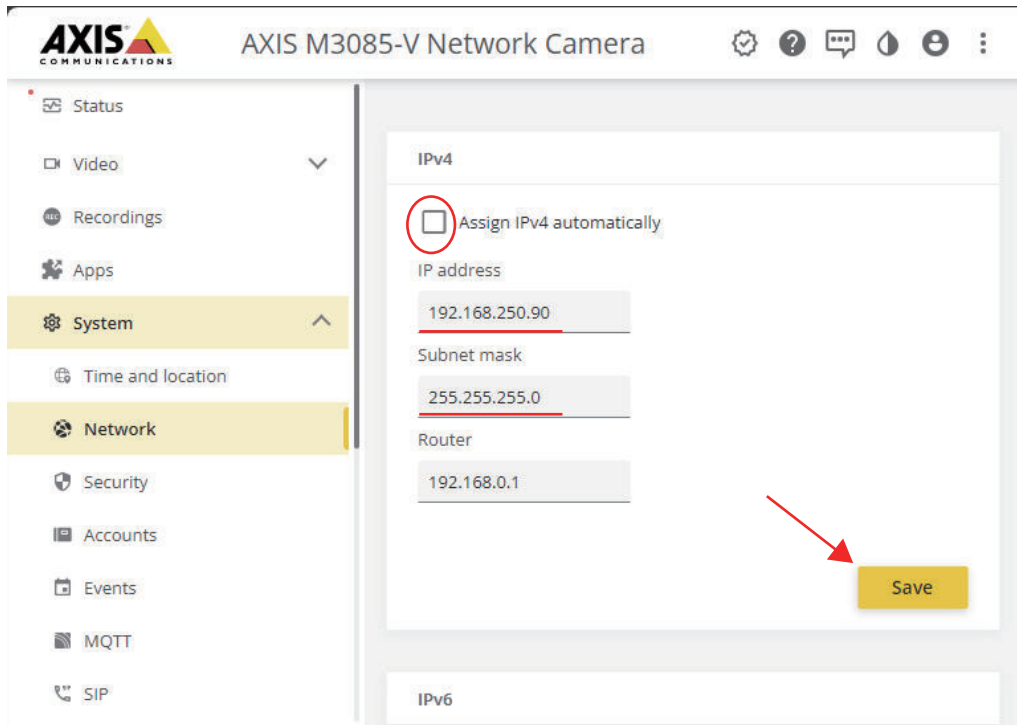


Additional Information

You can change the frame rate of recording on some camera models. Refer to the *A2-2 Example of Video Recording Settings with a High Frame Rate* on page A2-15 for details.

- 6** Select **System - Network** on the left pane of the camera's Live View window to open the network settings window.
- 1) Uncheck the **Assign IPv4 automatically** check box for **IPv4**.
  - 2) With the **IP address** and **Subnet mask** entered, click the **Save** button.
- In this example, the following settings are entered for the camera.

IP address	Subnet mask
192.168.250.90	255.255.255.0



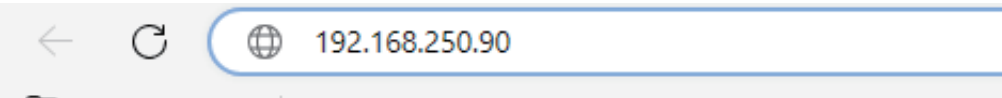
**Precautions for Correct Use**

Set the IP address and subnet mask for the camera to have the same network address as the Controller and network storage. If a different network address is set, you cannot control the camera from the Controller or the camera cannot save video files to the network storage.

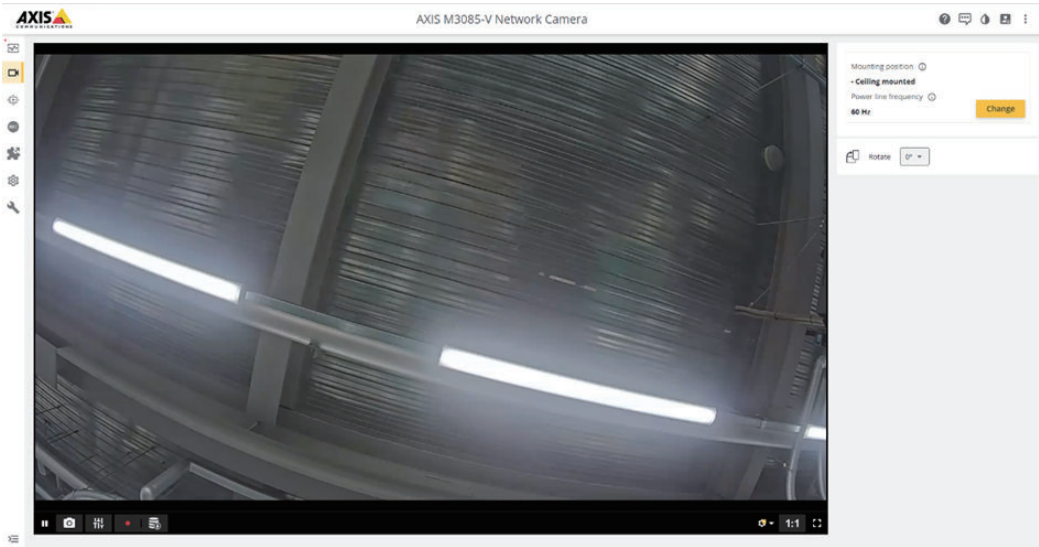
- 7** If the connection with the camera is lost by configuring the camera's network settings, edit the computer's IP address so that the computer has the same network address as the camera. Here, since the network address of the camera was changed from 192.168.0.X to 192.168.250.X, specify the computer's network address to 192.168.250.X.

IP address	Subnet mask
192.168.250.80	255.255.255.0

- 8** Enter the camera's IP address in the browser to access the camera. Then, the Live View window is displayed. In this example, specify the IP address 192.168.250.90 that was set to the camera.



On the Live View window, you can change the camera settings and adjust position while checking the image.

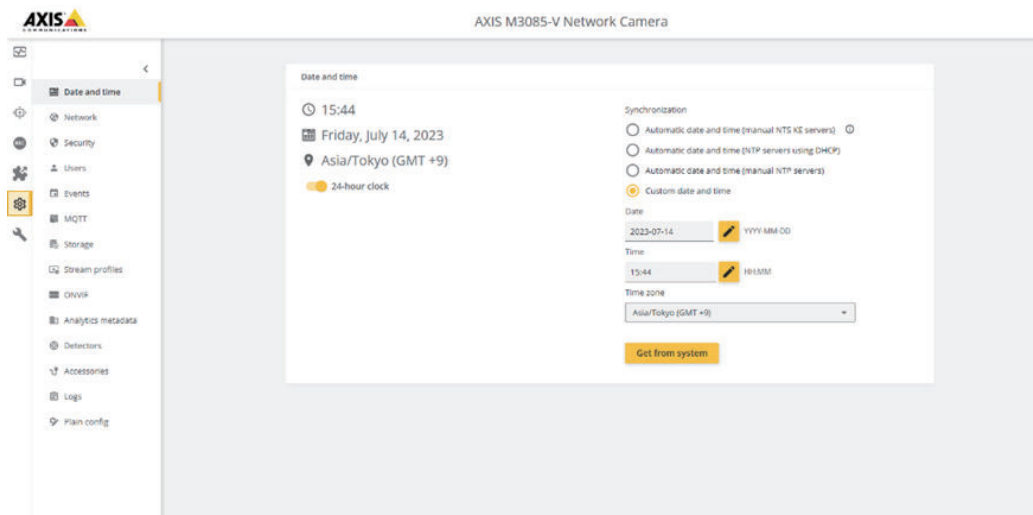


## 3-3 Clock Time Setting

When you use the sample program to set the clock time of the camera as the Controller, configure the following settings.

- Do not use the NTP server for the camera's clock setting.
- Match the time zone of the camera with the time zone set in the Controller.

- 1** Select **System – Date and time** in the left pane of the camera's Live View window to open the camera's clock settings window.
- 2** Select the **Custom date and time** option. From the **Time zone** pull down menu, select the same time zone as the Controller.



The camera's time is no longer set automatically, and the controller's time information can be set to the camera using the sample program.



### Precautions for Correct Use

If you do not use the sample program to set the camera's time, set the camera so that it refers to the same NTP server as the controller. Otherwise, you cannot play video correctly in Sysmac Studio.

# 3-4 Setting the Storage of Video Files

Set the storage location for video files recorded by the camera.



## Precautions for Correct Use

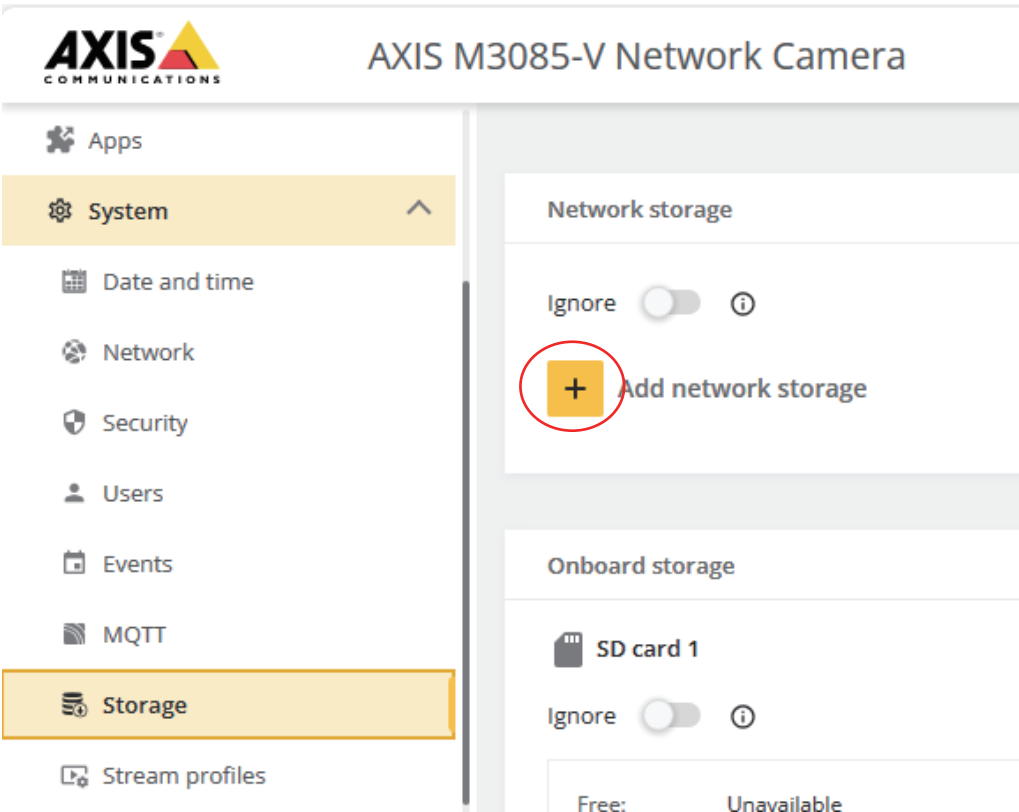
Specify the network storage as the camera's video file output destination. If a video file is output to the camera's SD card, the video file cannot be played on Sysmac Studio.



## Additional Information

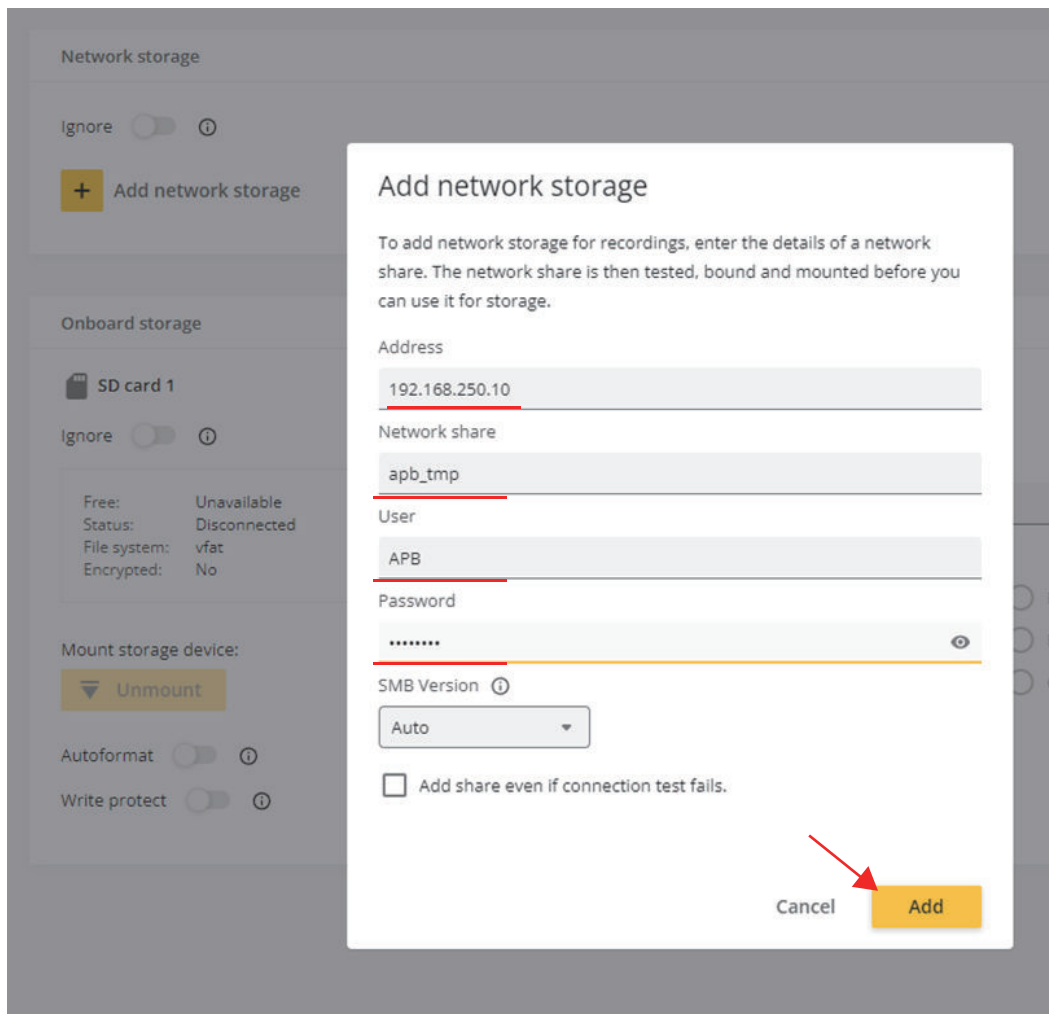
This manual provides a setting example for using a computer as a network storage device. Refer to *A2-3-1 Example of Setting to Use a Computer as Network Storage* on page A2-18 for the setting example.

- 1 Select the **System - Storage** on the left pane of the camera's Live View window to open the Network storage settings window.
- 2 Click on **Add network storage**.



- 3 Enter the information of the network storage where the video files will be saved, and then click the **Add** button.  
In this example, specify the settings as follows.

Item	Input value	Description
Address	192.168.250.10	IP address of the network storage
Network share	apb_tmp	Shared directory name of the network storage
User	APB	User name set for the network storage
Password	password	User password set for the network storage



When the connection to the storage is established, the status will be **Mounted**.



Network storage

 Network storage (124.5 GB)

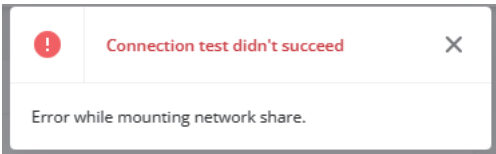
Ignore ☐ 

Host:	192.168.250.10
Share:	apb_tmp
Free:	58%
Status:	<u>Mounted</u>
File system:	cifs
Encrypted:	No



Additional Information

Even if the **User** and **Password** settings are correct, depending on the network storage settings, an error in the figure below may occur when the camera mounts the network storage.



In this case, enter "(network storage IP address)\(user name)" in the **User** field in the **Add network storage** window and try mounting again.

Add network storage

To add network storage for recordings, enter the details of a network share. The network share is then tested, bound and mounted before you can use it for storage.

Address  
192.168.250.10

Network share  
apb\_tmp

User  
192.168.250.10\APB

Password  
\*\*\*\*\*

SMB Version ⓘ  
Auto

☐ Add share even if connection test fails.

Cancel Add

4 Set the retention time for video files.

Specify the number of days to keep video files in the **Number of days** field.

Network storage

Network storage (124.5 GB)

Ignore

Host: 192.168.250.10

Share: apb\_tmp

Free: 58%

Status: Mounted

File system: cifs

Encrypted: No

Retention time

As long as possible

Number of days

1

[1..7000]

Tools

Test connection

Format

Use tool

Unmount, unbind and remove network share:

Remove network storage

Write protect



Precautions for Correct Use

When the period specified here has elapsed, the recorded video files will be automatically deleted. Please keep backups or take other measures as needed.



Additional Information

The retention time for video files is activated on the camera immediately after the settings are entered.

## 3-5 Configuring Virtual Input

You can set up recording rules according to the virtual input status of the Axis camera.

The sample programs control camera recording from the Controller by controlling ON/OFF of the camera's virtual input.

Follow the steps below to configure the recording rules according to the virtual input status.

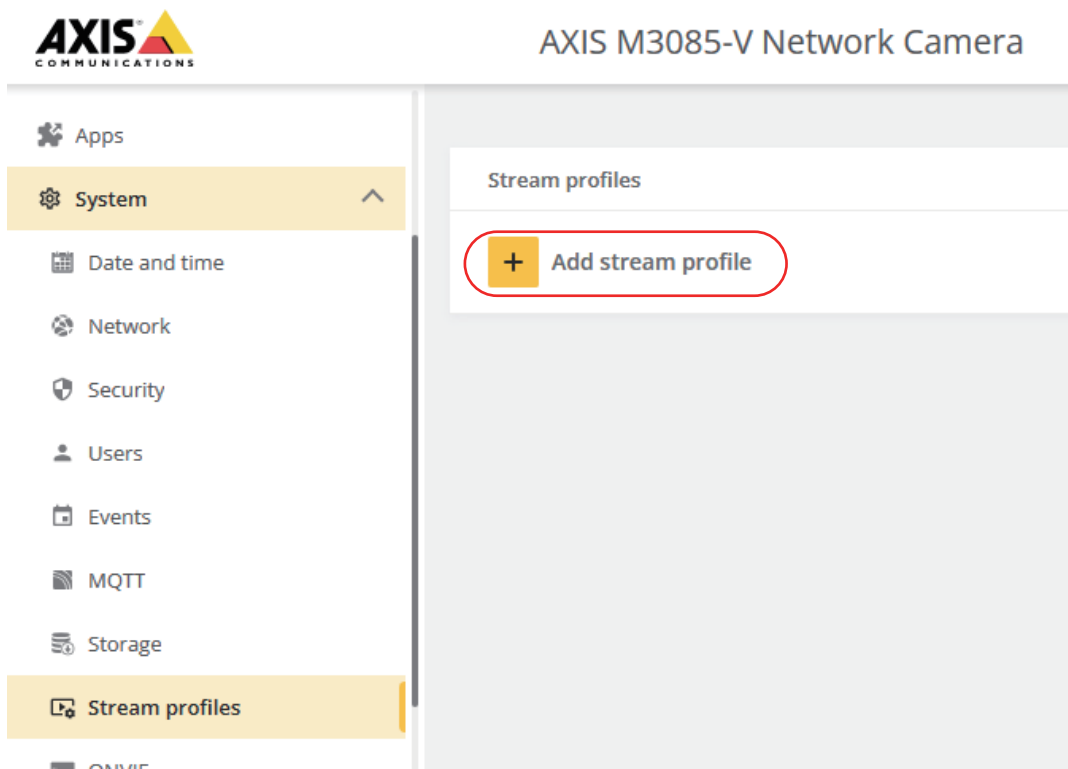
- 1** Configure the stream profile.  
This include settings for video file quality, such as video resolution, frame rate, etc.  
*3-5-1 Setting Stream Profile on page 3-15*
- 2** Configure the recording rule.  
Create a recording rule, assign a virtual input port, and specify a stream profile that you have previously set. Also, set the conditions to record videos and output storage of video files.  
*3-5-2 Configuring Recording Rules and Assigning Virtual Input on page 3-18*

### 3-5-1 Setting Stream Profile

Configure the profile of the video to be recorded. You can create multiple profiles and name as you like.

You will specify the profile you set up in this section later in the recording rule settings.

- 1** On the Live View window, select **System - Stream profiles** to display the Stream profiles settings window.
- 2** Click on **Add stream profile**.



- 3** Enter the settings of the stream profile, and then click the **Create** button.  
In this example, specify the settings as follows.

Item	Set value
Name	StreamProfile1
Video codec	H.264

Add

Preview

1 View Area 1

Name

StreamProfile1

Description

Video codec

☒ H.264

☐ H.265

☐ MJPEG

Resolution

☐

1920x1080 (16:9)

Frame rate (fps)

☐

0

[0..30] (0 = ∞)

Compression

☐

30

[0..100]

Zipstream

☐

Low

☐

Optimize for storage

☐

Dynamic FPS

☐

Dynamic GOP

☐

Mirror

GOP length

☐

31

[1..1023]

Bitrate control

☐

Variable

Cancel

Create

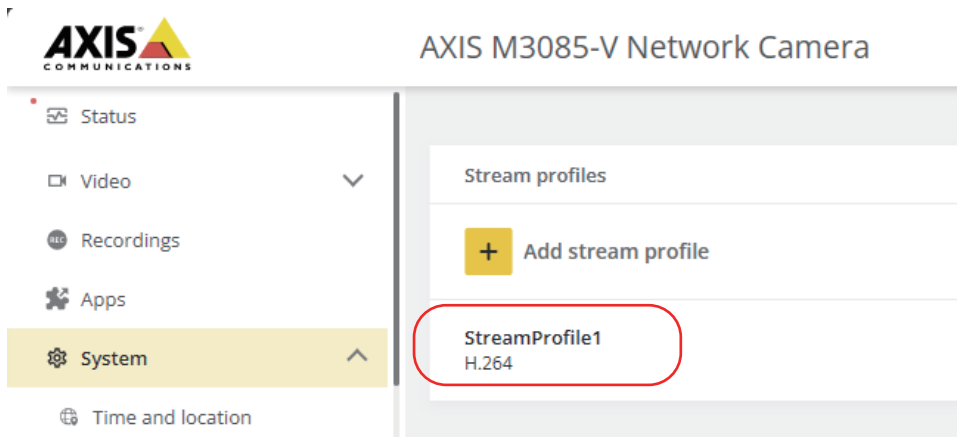
Precautions for Correct Use

To play videos in Sysmac Studio, set the video codec to H.264. Sysmac Studio cannot play videos recorded with video codecs other than H.264.

The stream profile has now been set up.

Camera Control Sample Programs INSTRUCTIONS (W641)

3-17



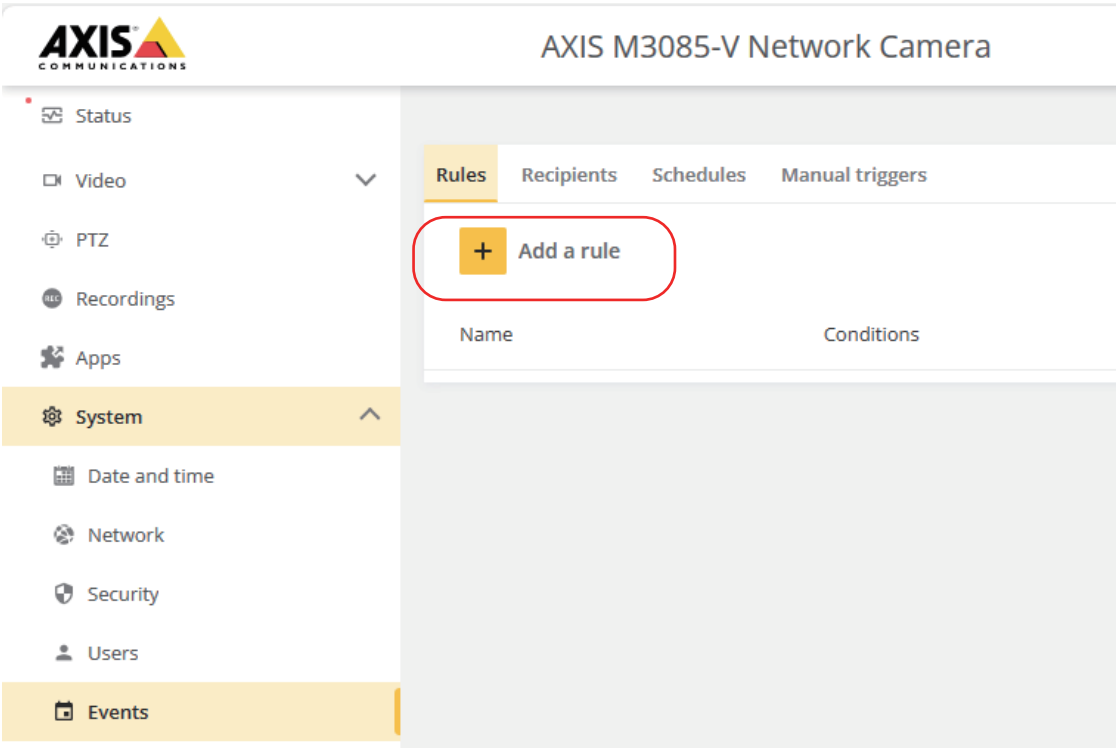
### 3-5-2 Configuring Recording Rules and Assigning Virtual Input

To record video files according to the state of the camera's virtual input, you need to create and configure the recording rule.

This section describes the procedure for setting up the camera according to the trigger method of the automation playback function.

Trigger method	Settings	Behavior
Pre/Post trigger method	This method records a video for the total period (d), which consists of <b>Prebuffer</b> time (b) and <b>Postbuffer</b> time (c), before and after the camera's virtual input ON (a).	
Start/Save trigger method	This method records video for the period (c), which starts when the camera's virtual input turns ON (a) and ends when the input turns OFF (b).	

- 1 Select **System - Events** in the left pane of the Live View window. The rule setting menu will be displayed.  
Click on **Add a rule**.



**2** Configure the recording rule of the camera according to the trigger method of automation playback.

• In case of Pre/Post trigger method

This example shows the settings when the **pre-trigger sampling time** is set to 20 seconds and **post-trigger sampling time** is set to 10 seconds in the Controller.

Item		Subitem	Set value
Use this rule			Select this check box.
Name			Enter the rule name of your choice. In this example, "Pre/Post Trigger" is entered.
Condition	Use this condition as a trigger		Select this check box.* <sup>1</sup>
	Condition		Select <b>Virtual input is active</b> .
	Port		Select the camera's virtual input port to assign to this recording rule. In this example, 1 is selected.
Action			Select <b>Record video</b> .
Storage			Select the <b>Network storage</b> .
Stream profile			Select the stream profile that you created earlier. In this example, "StreamProfile1" is selected.
Prebuffer			Set a period of <b>pre-trigger sampling time</b> of the automation playback settings. In this example, "20"seconds is set.
Postbuffer			Set a period of <b>post-trigger sampling time</b> of the automation playback settings. In this example, "00:10"(10 seconds) is set.

\*1. After you set the **Condition**, this check box will be selectable.

• In case of Start/Save trigger method

This example shows the settings when the **Sampling time** 10 seconds is set to the Controller.

Item	Subitem	Set value
Use this rule		Select this check box.
Name		Enter the rule name of your choice. In this example, "Start/Save Trigger" is entered.
Condition	Use this condition as a trigger	Do not select this check box.
	Condition	Select <b>Virtual input is active</b> .
	Port	Select the camera's virtual input port to assign to this recording rule. In this example, 2 is selected.
Action		Select <b>Record video while the rule is active</b> .
	Storage	Select the <b>Network storage</b> .
	Stream profile	Select the stream profile that you created earlier. In this example, "StreamProfile1" is selected.
	Prebuffer	Set "0" seconds for the recording rule that corresponds to the Start/Save trigger method.
	Postbuffer	Set "00:00" (0 seconds) in the recording rule for the Start/Save trigger method.



**Precautions for Correct Use**

Specify the network storage as the camera's video file output destination. If a video file is output to the camera's SD card, the video file cannot be played on Sysmac Studio.

- 3 Click the **Save** button.

Add rule

☒ Use this rule

Name

Pre/Post Trigger

Wait between actions (hh:mm:ss)

00:00:00

Condition

☒ Use this condition as a trigger

Virtual input is active

☐ Invert this condition

Cancel

Save



The recording rule has been registered.

Rules

Recipients

Schedules

Manual triggers

+

Add a rule

Name	Conditions	Action
Pre/Post Trigger <div><div></div></div>	Virtual input is active	Record video

## 3-6 Restarting the Camera and Checking the Settings

---

Make sure that the settings set to the camera are saved correctly even after the camera is restarted.

- Clock time and time zone settings
- Setting of storage of video files
- Setting of stream profiles and recording rules

# 4

## Sample Ver.2 Usage

<b>4-1</b>	<b>Security Information .....</b>	<b>4-2</b>
<b>4-2</b>	<b>UpdateCameraTime.....</b>	<b>4-3</b>
4-2-1	Function.....	4-3
4-2-2	How to Use This Sample Program .....	4-3
4-2-3	Setting example.....	4-3
4-2-4	Specifications of Function block SetCameraTimeFromController .....	4-4
<b>4-3</b>	<b>PrePostTriggerRecording.....</b>	<b>4-7</b>
4-3-1	Function.....	4-7
4-3-2	How to Use This Sample Program .....	4-7
4-3-3	Setting example.....	4-8
4-3-4	Specification of function block ExecCameraRecording .....	4-8
<b>4-4</b>	<b>StartStopTriggerRecording .....</b>	<b>4-11</b>
4-4-1	Function.....	4-11
4-4-2	How to Use This Sample Program .....	4-11
4-4-3	Setting example.....	4-12
4-4-4	Function block ExecCameraRecording specification .....	4-12
<b>4-5</b>	<b>Timing Charts .....</b>	<b>4-13</b>
<b>4-6</b>	<b>Troubleshooting .....</b>	<b>4-14</b>
<b>4-7</b>	<b>Error Codes .....</b>	<b>4-16</b>

## 4-1 Security Information

---



### Precautions for Correct Use

---

The sample programs assume that you are using an Axis camera in a local network that is isolated from external networks. Please note that authentication information such as username and password to be registered will be included in the Sysmac Studio project without encryption. So, take the following precautionary measures.

- Do not use the username and password that are registered for the camera with the Controller or other devices.
  - To protect against theft or leakage of your username and password registered for the camera, consider the following:
    - a) Set a password for your Sysmac Studio project and use the data protection feature. Reference the sample programs and describe the authentication information of the camera as a constant (literal). The initial value set in the variable is not encrypted by the data protection function.
    - b) Restrict access to the SD Memory Card to which project backups are saved and locations where backups are stored. Specifically, manage the media and entry and exit for access control.
-

## 4-2 UpdateCameraTime

### 4-2-1 Function

Use this program POU to set the Controller's clock time information on the camera.

- Camera's clock time can be set up to seconds.
- Before using this program POU, disable the NTP server for clock time setting of the camera, and then set the camera's time zone to match the time zone of the Controller. Refer to *A2-3-1 Example of Setting to Use a Computer as Network Storage* on page A2-18 for settings on the camera.

This program POU has been confirmed with the cameras described in *2-2 Confirmed with Sample Ver.2 Camera* on page 2-4.



#### Precautions for Correct Use

Omron does not guarantee the operation of those cameras.



#### Additional Information

Do not use this program POU when the NTP server is used for clock time setting on the camera.

### 4-2-2 How to Use This Sample Program

Disable the NTP server for clock time setting of the camera, and set the camera's time zone to match the time zone of the Controller.

Refer to *3-3 Clock Time Setting* on page 3-10 for the settings of camera clock time.

- 1 Set the following for the input variable of function block instance *updateTime*.

Input Variables	Value to be set as initial value
IsSequire	Set to TRUE if the camera settings enabled HTTPS communication.
CameraIPAddr	Enter the IP address of the camera.
UserName	Enter the camera's user name.
Password	Enter the password for the user name of the camera.
AdjustTimeProcess	Nothing is set.
TimeOffset	Set the offset from UTC, which is specified to the Controller's time zone.

- 2 Edit the execution condition for your system Input variables *Execute*.  
In the sample program, the internal variable *timeTrigger* TRUE.
- 3 Make sure that the camera and network storage have booted, and then turn ON the power supply to the Controller.

### 4-2-3 Setting example

Set the following for the input variable of the function block instance *updateTime*.



**Additional Information**

This assumes that the camera is configured to support HTTPS communication.

Variable	Setting example	Description
IsSequire	TRUE	Set to TRUE if the camera settings enabled HTTPS communication.
CameraIPAddr	'192.168.250.90'	Enter the IP address of the camera.
UserName	'root'	Enter the camera's user name.
Password	'password'	Enter the password for the user name of the camera.
AdjustTimeProcess	-	Nothing is set.
TimeOffset	T#9h00m	Set the offset from UTC, which is specified to the Controller's time zone.

When an error occurs, output variable *Error* will change to TRUE. Troubleshooting when an error occurs, see4-6 *Troubleshooting* on page 4-14.

**4-2-4 Specifications of Function block SetCameraTimeFromController**

In this program POU, the function block SetCameraTimeFromController is used to update the camera's time information with the Controller's time. This section describes the specifications of SetCameraTimeFromController.

Graphic expression	ST expression
SetCameraTimeFromController_instance	SetCameraTimeFromController_instance(
SetCameraTimeFromController	Execute:=,
Execute	IsSecure:=,
Done	CameraIPAddr:=,
IsSecure	UserName:=,
Busy	Password:=,
CameraIPAddr	AdjustTimeProcess:=,
Error	TimeOffset:=,
UserName	Done=>,
ErrorProcess	Busy=>,
Password	Error=>,
ErrorStage	ErrorProcess=>,
AdjustTimeProcess	ErrorStage=>,
ErrorID	ErrorID=>);
TimeOffset	

**Overview**

Set the time information of the Axis camera with the time information of the Controller . Check the OS version of the camera and use the VAPIX command appropriate for the camera.

## Input variables

Variable Name	Data Types	Description	Valid Ranges	Unit	Initial Value
Execute	BOOL	<ul style="list-style-type: none"> <li>• True Execute</li> <li>• False Do Not Execute</li> </ul>	True,False	-	False
IsSecure	BOOL	<ul style="list-style-type: none"> <li>• True Communicate via HTTPS</li> <li>• False Communicate via HTTP</li> </ul>	True,False	-	True
Camera- PAddr	STRING	IP address of the camera	15 characters max.	-	Not present
UserName	STRING	User name registered for the camera	63 characters max.	-	Not present
Password	STRING	Password registered on the camera	63 characters max.	-	Not present
AdjustTi- meProcess	eCAM_Control- Process	<ul style="list-style-type: none"> <li>• (Not specified) Use the interface according to the camera's OS version</li> <li>• CAM_ADJUST_DATE Use date.cgi</li> <li>• CAM_ADJUST_TIME Use time.cgi</li> </ul>	One of the follow- ing.	-	Not present
TimeOffset	TIME	Time offset from UTC (Coordinated Universal Time)	T#-12h00m~ T#14h00m	-	T#0h00m



### Additional Information

If the camera's OS version has already been determined, use the input variable *AdjustTimeProcess* to *CAM\_ADJUST\_DATE* or *CAM\_ADJUST\_TIME* by entering this, the process of reading the camera's OS version will be omitted and the camera's time will be set.

## Output Variables

Variable Name	Data Types	Description	Valid Ranges	Unit
Done	BOOL	<ul style="list-style-type: none"> <li>• True Normal end</li> <li>• False Error end, execution in progress, or execution condition not met.</li> </ul>	True, False	-
Busy	BOOL	<ul style="list-style-type: none"> <li>• True Executing</li> <li>• False Not executing</li> </ul>	True, False	-

Variable Name	Data Types	Description	Valid Ranges	Unit
Error	BOOL	<ul style="list-style-type: none"> <li>• True Error end</li> <li>• False Normal end, execution in progress, or execution condition not met.</li> </ul>	True, False	-
ErrorProcess	eCAM_ControlProcess	Refer to <i>4-6 Troubleshooting</i> on page 4-14.		-
ErrorStage	eHTTP_ReqStage			-
ErrorID	WORD			-



## 4-3 PrePostTriggerRecording

### 4-3-1 Function

Use this program POU to save the video for a set period of time before and after the **file save trigger**. The period is specified in the camera's recording rule.

This program POU has been confirmed with the cameras described in *2-2 Confirmed with Sample Ver.2 Camera* on page 2-4.



#### Precautions for Correct Use

Omron does not guarantee the operation of those cameras.



#### Additional Information

Depending on the camera model, video resolution, frame rate and other settings, and subject conditions, recorded video may be shorter than the time set in the **Prebuffer** time.



#### Version Information

We have confirmed that the upper limit value that can be set for the **Prebuffer** time varies depending on the OS version of the camera.

OS version	Prebuffer set value (upper limit)
8.40.19	9999 seconds
9.80.28	59 seconds
10.12.166	59 seconds
11.4.63	99 seconds

### 4-3-2 How to Use This Sample Program

Create **recording rules** of the camera with settings that match the Controller's **Pre/Post trigger** method in advance.

Refer to *3-5-2 Configuring Recording Rules and Assigning Virtual Input* on page 3-18 for settings of the camera.

- 1 Set the following for the input variable of function block instance *prePostRecording*.

Input Variables	Value to be set as initial value
IsSequre	Set to TRUE if the camera settings enabled HTTPS communication.
CameraIPAddr	Enter the IP address of the camera.
UserName	Enter the camera's user name.
Password	Enter the password for the user name of the camera.
VIPortNo	Specify the virtual input port number of the camera to which the created recording rule is assigned. This sample program assumes that the camera's virtual input port "1" is assigned to the recording rule that uses <b>Pre/Post trigger</b> method.
TriggerInterval	Nothing is set.

- 2 Edit the execution condition for your system Input variables *Execute*.  
This sample program controls the virtual input of the camera so that the video is saved in accordance with the **Pre/Post trigger** method set in the **sampling setting 1** in the Controller, using TRUE in the global variable *PrePostTrigger* as a condition.
- 3 Make the execution conditions of the input variable *Execute* while the camera and network storage have booted.

### 4-3-3 Setting example

Set the following for the input variable of function block instance *prePostRecording*.



#### Additional Information

This assumes that the camera is configured to support HTTPS communication.

Variable	Setting example	Description
IsSequire	TRUE	Set to TRUE if the camera settings enabled HTTPS communication.
CameraIPAddr	'192.168.250.90'	Enter the IP address of the camera.
UserName	'root'	Enter the camera's user name.
Password	'password'	Enter the password for the user name of the camera.
VIPortNo	10#1	Specify the virtual input port number of the camera to which the created recording rule is assigned. This sample program assumes that the camera's virtual input port "1" is assigned to the recording rule that uses <b>Pre/Post trigger</b> method.
TriggerInterval	-	Nothing is set.

When an error occurs, output variable *Error* will change to TRUE. Troubleshooting when an error occurs, see 4-6 *Troubleshooting* on page 4-14.

### 4-3-4 Specification of function block ExecCameraRecording

This program POU uses the function block ExecCameraRecording to control camera recordings. This section describes the specifications of ExecCameraRecording.

Graphic expression	ST expression
<div> <div>ExecCameraRecording_instance</div> <div> <div>ExecCameraRecording</div> <div> <div>Execute</div> <div>Done</div> <div>IsSecure</div> <div>Busy</div> <div>CameraIPAddr</div> <div>Error</div> <div>UserName</div> <div>ErrorProcess</div> <div>Password</div> <div>ErrorStage</div> <div>VIPortNo</div> <div>ErrorID</div> <div>TriggerInterval</div> </div> </div> </div>	ExecCameraRecording_instance( Execute:=, IsSecure:=, CameraIPAddr:=, UserName:=, Password:=, VIPortNo:=, TriggerInterval:=, Done=>, Busy=>, Error=>, ErrorProcess=>, ErrorStage=>, ErrorID=>);

## Overview

Control recordings through the Axis camera's virtual input port.

## Input variables

Variable Name	Data Types	Description	Valid Ranges	Unit	Initial Value
Execute	BOOL	<ul style="list-style-type: none"> <li>• True Execute</li> <li>• False Do Not Execute</li> </ul>	True,False	-	False
IsSecure	BOOL	<ul style="list-style-type: none"> <li>• True Communicate via HTTPS</li> <li>• False Communicate via HTTP</li> </ul>	True,False	-	True
CameraIPAddr	STRING	IP address of the camera	15 characters max.	-	Not present
UserName	STRING	User name registered for the camera	63 characters max.	-	Not present
Password	STRING	Password registered on the camera	63 characters max.	-	Not present
VIPortNo	USINT	The virtual input port number set in 3-5 <i>Configuring Virtual Input</i> on page 3-15.	Conforms to Axis camera specifications	-	1
TriggerInterval	TIME	Virtual input port ON time	Conforms to Axis camera specifications	-	T#0S

## Output Variables

Variable Name	Data Types	Description	Valid Ranges	Unit
Done	BOOL	<ul style="list-style-type: none"> <li>• True Normal end</li> <li>• False Error end, execution in progress, or execution condition not met.</li> </ul>	True, False	-
Busy	BOOL	<ul style="list-style-type: none"> <li>• True Executing</li> <li>• False Not executing</li> </ul>	True, False	-
Error	BOOL	<ul style="list-style-type: none"> <li>• True Error end</li> <li>• False Normal end, execution in progress, or execution condition not met.</li> </ul>	True, False	-
ErrorProcess	eCAM_ControlProcess	Refer to <i>4-6 Troubleshooting</i> on page 4-14.		-
ErrorStage	eHTTP_ReqStage			-
ErrorID	WORD			-

## 4-4 StartStopTriggerRecording

### 4-4-1 Function

Use this program POU to save the video for the collection time set in the Variable log output settings. The saved video starts when the start trigger rises. This program POU has been confirmed with the cameras described in *2-2 Confirmed with Sample Ver.2 Camera* on page 2-4.



#### Precautions for Correct Use

Omron does not guarantee the operation of those cameras.



#### Additional Information

The variable log of the automation playback is output only when the **file save trigger** is established. However, this sample program saves video for the period that the **start trigger** is ON, regardless of the state of the **file save trigger**.

### 4-4-2 How to Use This Sample Program

Create **recording rules** of the camera with settings that match the Controller's **Start/Save trigger** method in advance.

Refer to *3-5-2 Configuring Recording Rules and Assigning Virtual Input* on page 3-18 for settings of the camera.

- 1 Set the following for the input variable of function block instance *startStopRecording*:

Input Variables	Value to be set as initial value
IsSequire	Set to TRUE if the camera settings enabled HTTPS communication.
CameraIPAddr	Enter the IP address of the camera.
UserName	Enter the camera's user name.
Password	Enter the password for the user name of the camera.
VIPortNo	Specify the virtual input port number of the camera to which the created recording rule is assigned. This sample program assumes that the camera's virtual input port "2" is assigned to the recording rule that uses <b>Start/Save trigger</b> method.
TriggerInterval	Set the same time in seconds as <b>Sampling time</b> specified in the <b>Variable log output settings</b> of the <b>Start/Save trigger</b> method. This sample program assumes that the <b>Sampling time</b> in the <b>Variable log output settings</b> of the <b>Start/Save trigger</b> method in the Controller is set to 10 seconds.

- 2 Edit the execution condition for your system Input variables *Execute*.

This sample program control the virtual input of the camera so that the video is saved in accordance with the **Start/Save trigger** method set in the **sampling setting 1** in the Controller, using TRUE in the global variable *StartTrigger* as a condition.

- 3** Make the execution conditions of the input variable *Execute* while the camera and network storage have booted.

### 4-4-3 Setting example

Set the following for the input variable of function block instance *startStopRecording*.



#### Additional Information

This assumes that the camera is configured to support HTTPS communication.

Variable	Setting example	Description
IsSequire	TRUE	Set to TRUE if the camera settings enabled HTTPS communication.
Cameral-PAddr	'192.168.250.90'	Enter the IP address of the camera.
UserName	'root'	Enter the camera's user name.
Password	'password'	Enter the password for the user name of the camera.
VIPortNo	10#2	Specify the virtual input port number of the camera to which the created recording rule is assigned. This sample program assumes that the camera's virtual input port "1" is assigned to the recording rule that uses <b>Pre/Post trigger</b> method.
TriggerInterval	T#10s	Set the same time in seconds as <b>Sampling time</b> specified in the <b>Variable log output settings</b> of the <b>Start/Save trigger</b> method. This sample program assumes that the <b>Sampling time</b> in the <b>Variable log output settings</b> of the <b>Start/Save trigger</b> method in the Controller is set to 10 seconds.

When an error occurs, output variable *Error* will change to TRUE. Troubleshooting when an error occurs, see 4-6 *Troubleshooting* on page 4-14.

### 4-4-4 Function block ExecCameraRecording specification

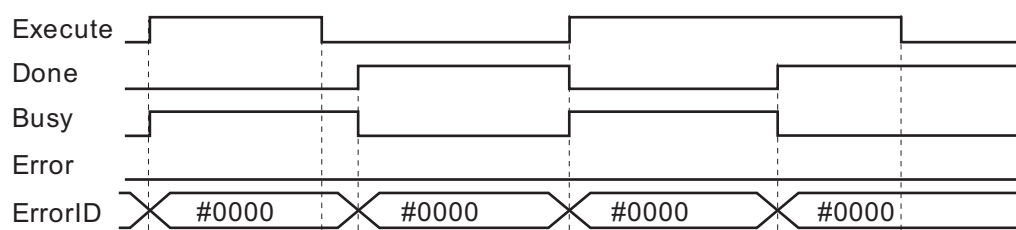
Refer to 4-3-4 *Specification of function block ExecCameraRecording* on page 4-8.

## 4-5 Timing Charts

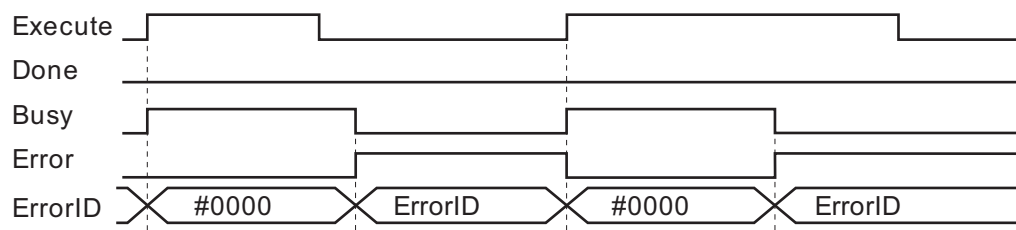
All function block POUs in the sample program run as follows.

- *Busy* changes to TRUE when *Execute* changes to *True*.
- In case of executing finish normally, *Done* changes to *True*.
- If an error occurs during executing, *Error* changes to *True*, and *Busy* changes to *False* and error ends. Refer to the 4-6 *Troubleshooting* on page 4-14 for details.
- Even if *Execute* changes to *False* before executing finish, processing will continue until it ends normally or abnormally.
- Even if *Execute* changes to *False* after completion of execution, the output variable is not updated.
- After executing completed, the output variable is initialized at the same time as detection of the rising edge of *Execute*.

**Timing Chart for Normal End**



**Timing Chart for Error End**



## 4-6 Troubleshooting

This section describes troubleshooting when an error occurs in this sample program.

The following function block POUs included in this sample program are all processed across the task cycle of the controller.

- a. SetCameraTimeFromController
- b. ExecCameraRecording

If an error occurs in these function block POUs, it behaves as follows.

- 1** Set the output variable *Error* to *True*  
If *Error* is *True*, you can determine that an error has occurred.
- 2** Set the output variable *ErrorProcess* to the *value indicating the control processing of the camera* that failed to execute.  
*ErrorProcess* is the enumeration type *eCAM\_ControlProcess* takes the values in the table below.

Value (Name)	Processing
CAM_INIT	Initialization process
CAM_READ_OS_VERSION	Reading the OS version of the camera
CAM_ADJUST_DATE	Update camera time to controller time
CAM_ADJUST_TIME	
CAM_ACTIVATE_VI	ON of the virtual input port of the camera
CAM_WAIT_DEACTIVATE_VI	Standby for turning OFF the virtual input port of the camera
CAM_DEACTIVATE_VI	Turning OFF the virtual input port of the camera
CAM_CONTROL_FINISH	Success
CAM_CONTROL_ERRSTOP	Error End

- 3** Set the output variable *ErrorStage* to the *value indicating the HTTP communication processing* that failed during the camera control processing.  
*ErrorStage* is the enumeration type *eHTTP\_ReqStage* takes the values in the table below.

Value (Name)	Processing
HTTP_INIT	Initialization process
TCP_INIT_CONNECT	Creating a TCP Connection
TCP_INIT_VALID	Verifying TCP Connection Status
TCP_SET_OPTION	Configuring TCP Connections
TCP_INIT_CLRBUF	HTTP receive buffer initialization
HTTP_SEND	Sending HTTP Requests
HTTP_RCV_RESP	Receiving HTTP Responses
HTTP_VALID_RESP	Verifying HTTP Responses
HTTP_OK	Checking whether HTTP requests continue or not
HTTP_SEND_COMPLETE	TCP connection normal disconnection
HTTP_CONTINUE	HTTP communication continues
HTTP_REDIRECTED	Redirect response
HTTP_ERR	HTTP error handling
TLS_INIT_CONNECT	Initializing TLS Sessions



Value (Name)	Processing
TLS_INIT_CLRBUF	TLS receive buffer initialization
HTTPS_SEND	Sending HTTPS Requests
HTTPS_RCV_RESP	Receiving HTTPS Responses
HTTPS_VALID_RESP	Verifying HTTPS Responses
HTTPS_OK	Checking whether HTTP requests continue or not
HTTPS_SEND_COMPLETE	Successful completion of the TLS session
HTTPS_CONTINUE	HTTPS communication continues
HTTPS_REDIRECTED	Redirect response
HTTPS_ERR	HTTPS error handling
SUCCESS_END	Success
TCP_STATUS_ERR	TCP status read error handling
TLS_STATUS_ERR	TLS Status Read Error Handling
CLOSE_TLS_ERR	Force Disconnect TLS Session Due to Error
CLOSE_TCP_ERR	Force Disconnect TCP connection Due to error
ERR_END	Error End

- 4** The error code corresponding to *ErrorStage* is output to the output variable *ErrorID*. For possible values of *ErrorID*, see 4-7 Error Codes on page 4-16.

From *ErrorProcess*, *ErrorStage* and *ErrorID*, identify what kind of error occurred during what process, and take the necessary measures.

## 4-7 Error Codes

This section describes the possible values of *ErrorID* according to *ErrorStage*.

ErrorStage that can occur	ErrorID	Overview	Correction
TCP_INIT_CONNECT, TCP_INIT_VALID, TCP_SET_OPTION, TCP_INIT_CLRBUF, HTTP_SEND, HTTP_RCV_RESP, HTTP_VALID_RESP, HTTP_SEND_COMPLETE	16#2003	Socket Status Error	For event codes with 5401 appended to the upper four digits of the error code, see the description in the <i>NJ/NX-series Troubleshooting Manual (Cat. No. W503)</i> . For example, when the error code of the target instruction is 16#2003, refer to the explanation of event code, 54012003 hex.
	16#2006	Socket Time-out	
	16#2007	Socket Handle Out of Range	
	16#2008	Socket Communications Resource Overflow	
TLS_INIT_CONNECT	16#2003	Socket Status Error	
	16#2006	Socket Time-out	
	16#2007	Socket Handle Out of Range	
	16#2008	Socket Communications Resource Overflow	
	16#200A	Invalid TLS Session Name	
	16#200B	Access to the Certificate Failed	
	16#200C	TLS Session Establishment Error	
	16#200E	Invalid TLS Session Handle	
	16#200F	TLS Error	
TLS_INIT_CLRBUF, HTTPS_SEND, HTTPS_RCV_RESP, HTTPS_VALID_RESP, HTTPS_SEND_COMPLETE	16#200A	Invalid TLS Session Name	
	16#200B	Access to the Certificate Failed	
	16#200C	TLS Session Establishment Error	
	16#200E	Invalid TLS Session Handle	
	16#200F	TLS Error	

ErrorStage that can occur	ErrorID	Overview	Correction
HTTP_INIT	16#6000	Secure socket count limit exceeded	Keep the number of cameras communicating simultaneously via HTTPS within the controller's specifications.
	16#7000	IP address error	Specify the IP address of the camera with the correct IP address.
TCP_STATUS_ERR	16#0000	TCP connection status is CLOSED.	For more detailed information on TCP connection status, see <i>NJ/NX-series CPU Unit Built-in EtherNet/IP Port User's Manual (Cat. No. W506)</i> .
	16#0006	TCP connection status is FIN WAIT-1.	
	16#0007	TCP connection status is CLOSING.	
	16#0009	TCP connection status is FIN WAIT-2.	
	16#000A	TCP connection status is TIME WAIT.	
HTTP_REDIRECTED, HTTPS_REDIRECTED	16#0301, 16#0302	HTTP/HTTPS specify error	Set the input variable <i>IsSecure</i> according to the camera settings.
HTTP_ERR, HTTPS_ERR	16#0401	authentication error	Set the input variables <i>UserName</i> and <i>Password</i> according to the camera settings.
	Others	Other HTTP errors	Depends on camera specifications. Please take action according to the response code based on the HTTP specification.



# 5

## Controller Settings

<b>5-1</b>	<b>Secure Socket Configuration Procedure .....</b>	<b>5-2</b>
5-1-1	If you do not use a client certificate and a client private key .....	5-3
5-1-2	If you use a client certificate and a client private key .....	5-4
<b>5-2</b>	<b>Using Sample Programs.....</b>	<b>5-6</b>
5-2-1	Assigning Program POU to Task.....	5-6
5-2-2	Establishment of Trigger Conditions and Saving Video .....	5-8

## 5-1 Secure Socket Configuration Procedure

The Controller must be configured with a secure socket before communication with the camera via HTTPS. This section describes how to configure secure sockets using Sysmac Studio. Refer to the *NJ/NX-series CPU Unit Built-in EtherNet/IP Port User's Manual (Cat. No. W506)* for more information about the Controller secure socket feature.



### Precautions for Correct Use

The following operational methods cannot be mixed in this sample program. Please use one of them uniformly.

- If you do not use a client certificate and a client private key
- If you use a client certificate and a client private key



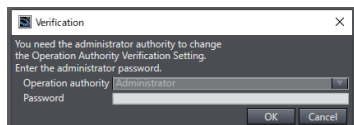
### Additional Information

When user authentication or operation authority verification is set, only *Administrator* can use the secure socket setting function.

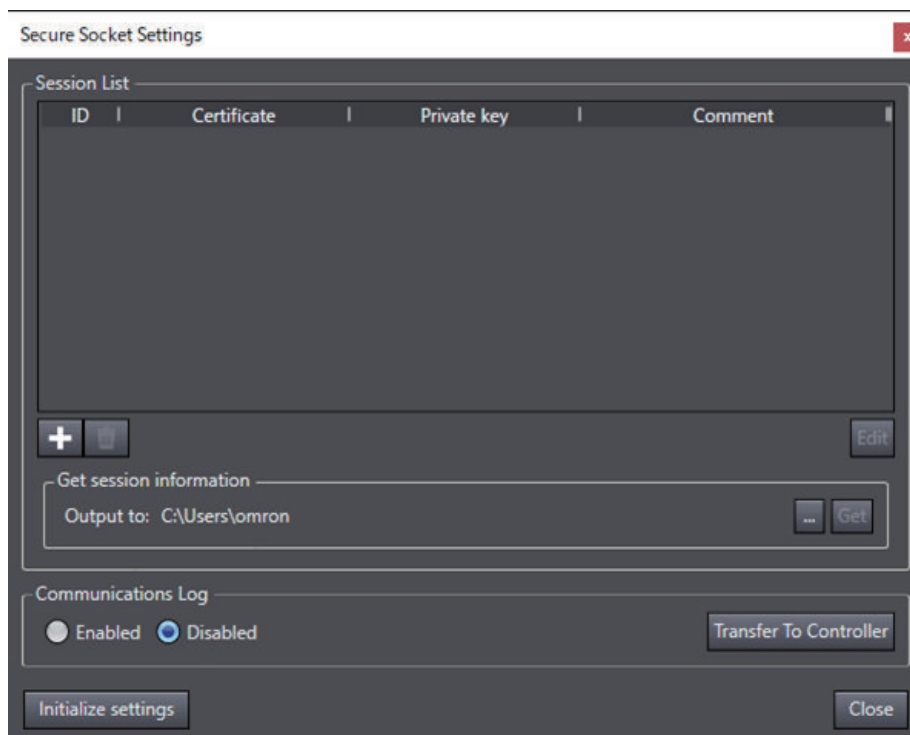
- 1 Change the Controller to PROGRAM mode.  
Secure socket setting can be set only when the operating mode is PROGRAM mode.
- 2 Select **Controller - Security - Secure Socket Settings** on the Sysmac Studio.  
If user authentication is set, the following **Authentication** Dialog Box is displayed.



If operation authority verification is set, the following **Verification** Dialog Box is displayed.



- 3 Enter the *Administrator* password authenticated when connecting online, and click the **OK** Button.  
After authentication is completed, the **Secure Socket Settings** Dialog Box is displayed.



- 4 Configure secure sockets according to the settings of the camera being communicated with. Please set the secure socket depending on the number of cameras communicating via HTTPS.

### 5-1-1 If you do not use a client certificate and a client private key

The setting procedure to start secure socket services when the client certificate and client private key are not used is as follows.

As a prerequisite, set the built-in EtherNet/IP of the CPU Unit as follows.

- If the server is on the Internet, configure the default gateway and routing table.  
If the server is specified by an item other than the IP address, such as "xxx.com", configure the DNS server settings.
- Configure NTP Settings.

The NTP Settings are optional. It is recommended for matching with the server time.

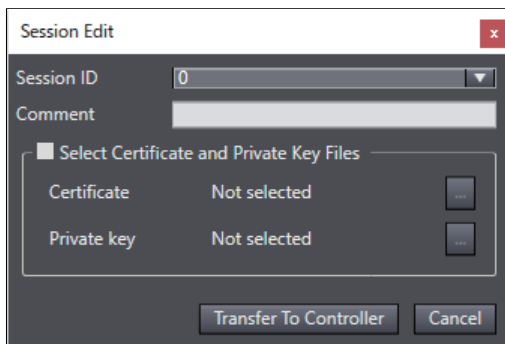
Check with the network administrator of the installation site for the settings of the default gateway, routing table, DNS server, and NTP server.

The secure socket setting in this procedure is described in the following example.

- The session ID set in the secure socket setting is 0.

- 1 Configure the server and check the server's IP address, HOST name, and other settings. Check with the server installer for details on how to check.
- 2 Configure the secure socket setting.  
Use the Sysmac Studio to configure secure socket setting for the session ID. Set different session IDs for all connected destinations.
  - 1) Connect the Sysmac Studio online, and select **Controller - Security - Secure Socket Settings**.

- 2) Press the **+** Button in the **Session List** of the **Secure Socket Settings** Dialog Box.  
The **Session Edit** Dialog Box is displayed.
- 3) Select 0 for **Session ID** and enter the session comment if necessary.
- 4) Clear the **Select Certificate and Private Key Files** Check Box.
- 5) Click the **Transfer to Controller** Button to transfer the settings to the Controller.



To enable secure socket communications log, select **Communications Log** to **Enabled** in the **Secure Socket Settings** Dialog Box and click the **Transfer to Controller** Button.

In the steps above, a secure socket is configured with **session ID** is 0 and session name is *TLSSession0*. Repeat these steps for as many cameras as you want to communicate. The **session ID** increases by 1 and 2 with each iteration.

### 5-1-2 If you use a client certificate and a client private key

The setting procedure to start secure socket services when the client certificate and client private key are used is as follows.

As a prerequisite, set the built-in EtherNet/IP of the CPU Unit as follows.

- If the server is on the Internet, configure the default gateway and routing table.  
If the server is specified by an item other than the IP address, such as "xxx.com", configure the DNS server settings.
- Configure NTP settings.

The NTP settings are optional. It is recommended for matching with the server time.

Check with the network administrator of the installation site for the settings of the default gateway, routing table, DNS server, and NTP server.

The secure socket setting in this procedure is described in the following example.

- To connect the computer to the CPU Unit, an EtherNet/IP port is used. They are connected through Ethernet connection via a Hub or remote connection via USB.
- The IP address of the built-in EtherNet/IP port of the CPU Unit is set to 192.168.250.1.
- The session ID set in the secure socket setting is 0.

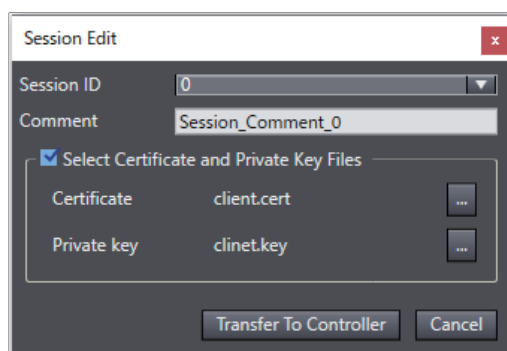
#### 1 Prepare the client certificate, client private key, and CA certificate.

In this procedure, the file name of the prepared client certificate is *client.cert*. The file name of the client private key is *client.key*.

Note that the prepared client certificate and client private key must be stored and managed by the customer.



- 2** Install the client certificate and CA certificate on the server.  
Check with the server administrator for details such as whether installation on the server is required.
- 3** Configure the server and check the server's IP address, HOST name, and other settings.  
Check with the server installer for details on how to check.
- 4** Configure the secure socket setting.  
Use the Sysmac Studio to configure session information for the session ID.
  - 1) Press the **+** Button in the **Session List** of the **Secure Socket Settings** Dialog Box.  
The **Session Edit** Dialog Box is displayed.
  - 2) Select 0 for **Session ID** and enter the session comment if necessary.
  - 3) Select the **Select Certificate and Private Key Files** Check Box.
  - 4) Click the buttons to display the file selection dialog box for **Certificate** and **Private key** and select the client certificate file *client.cert* and client private key file *client.key* respectively.
  - 5) Click the **Transfer to Controller** Button to transfer the settings to the Controller.



To enable secure socket communications log, select **Communications Log** to **Enabled** in the **Secure Socket Settings** Dialog Box and click the **Transfer to Controller** Button.

In the steps above, a secure socket is configured with **session ID** is 0 and session name is *TLSSession0*. Repeat these steps for as many cameras as you want to communicate. The **session ID** increases by 1 and 2 with each iteration.

## 5-2 Using Sample Programs

This section explains how to use the sample program to record videos linked to variable logs.

- 1 Assign the program POU to a task and start it.  
The sample programs include the following. Use the program POU that suits your system.

- **Sample Ver.2**

Function	POU name	Description
Align the clock time on the Controller and camera	UpdateCamera-Time	The time is set using a method based on the camera's OS version.
Control the camera according to the trigger method that specifies the variable log data range	PrePostTriggerRecording	Use this POU for Pre/Post trigger method.
	StartStopTriggerRecording	Use this POU for Start/Save trigger method.

- **Sample Ver.1**

Function	POU name	Description
Align the clock time on the Controller and camera	UpdateCamera-Time	Refer <i>Functions</i> on page A1-6 to see if your camera can be controlled.
	UpdateCamera-Time2	Refer <i>Functions</i> on page A1-9 to see if your camera can be controlled.
Control the camera according to the trigger method that specifies the variable log data range	PrePostTriggerRecording	Use this POU for Pre/Post trigger method.
	TriggeredIntervalRecording	Use this POU for Start/Save trigger method.

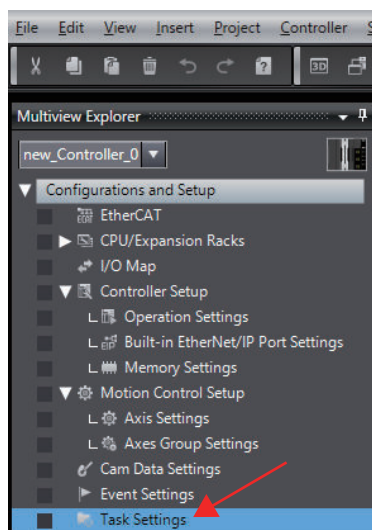
- 2 Make the trigger condition satisfied.  
According to the trigger conditions and settings, variable logs are output to the SD Memory Card in the Controller and video files are output to the network storage.

### 5-2-1 Assigning Program POU to Task

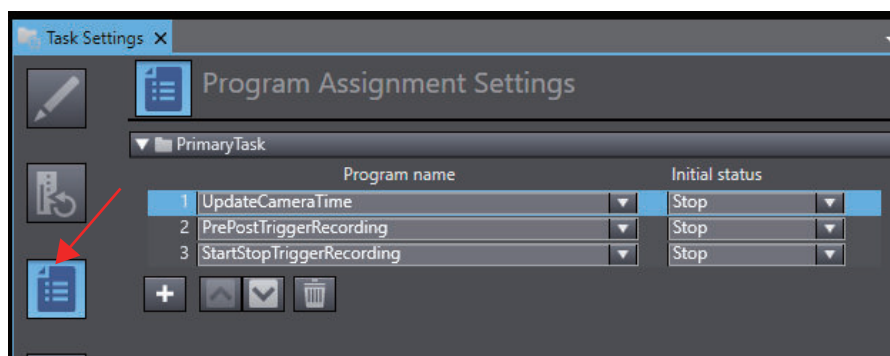
To use the sample program, you need to assign the program POU to a task.

This section describes how to assign the program POU to a task using a sample project as an example.

- 1 Open the Task Settings in Sysmac Studio.  
Double-click **Task Settings** in the Multiview Explorer.



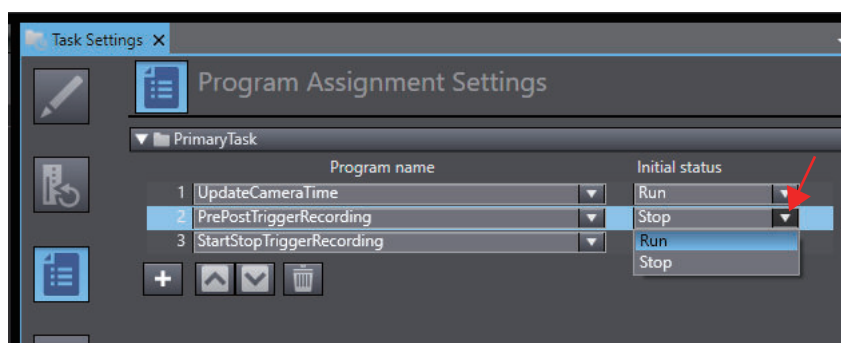
- 2** Open the Program Assignment Settings.  
A list of program POU's assigned to the task is displayed, so assign the program POU to execute.



### Additional Information

Program POU's whose **Initial status** is **Stop** will not run when the user program starts, even though they are assigned to a task.

- 3** Check if the **Initial status** of the program POU's that you want to execute is set to **Run**.  
Here, change the initial status of "UpdateCameraTime" and "PrePostTriggerRecording" from **Stop** to **Run**.



For other assignment to tasks, refer to the *Sysmac Studio Version 1 Operation Manual (Cat. No. W504)*.

5-2-2 Establishment of Trigger Conditions and Saving Video

The sample programs use common variables for trigger conditions for saving variable logs and videos. The steps to save a variable log and video are as follows. Here is an example using the sample program in Sample Ver.2.

- 1
- Align the time on the Controller and camera.  
If you want to use the sample program to align the clock time of the Controller and camera, establish the execution conditions of "UpdateCameraTime".



Additional Information

The Controller and camera each clock independently. If your system runs continuously, consider aligning the clock time in the Controller and camera at appropriate intervals.

- 2
- Make the recording trigger condition satisfied.  
The following global variables are defined in the sample programs.

Variable	Data type	Overview
PrePostTrigger	BOOL	Trigger of the <b>Pre/Post trigger</b> method
StartTrigger	BOOL	Start trigger of the <b>Start/Save trigger</b> method
SaveTrigger	BOOL	Save trigger of the <b>Start/Save trigger</b> method

When these variables rise, the following files are output.

Item	Output destination
Variable log file	SD Memory Card in the Controller
Video file	Network storage

# 6

## Playing Back Variable Logs and Videos

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<b>6-1</b>	<b>How to Start and Stop Playback .....</b>	<b>6-2</b>
6-1-1	Preparing Variable log .....	6-2
6-1-2	Procedure for Starting Playback.....	6-3
6-1-3	Procedure for Ending the Playback.....	6-4
<b>6-2</b>	<b>Troubleshooting When a Video Cannot be Played Back.....</b>	<b>6-5</b>

## 6-1 How to Start and Stop Playback

You can play the video recorded by executing the sample program and the variable log obtained by the Controller together on Sysmac Studio. This series of operations is referred to as “Playback” in Sysmac Studio.

This chapter provides an overview of how to start and stop playback. Refer to the *NX-series CPU Unit Automation Playback User's Manual (Cat. No. W639)* for details of the automation playback function.



### Additional Information

The specifications of video files that can be played on Sysmac Studio are as follows.

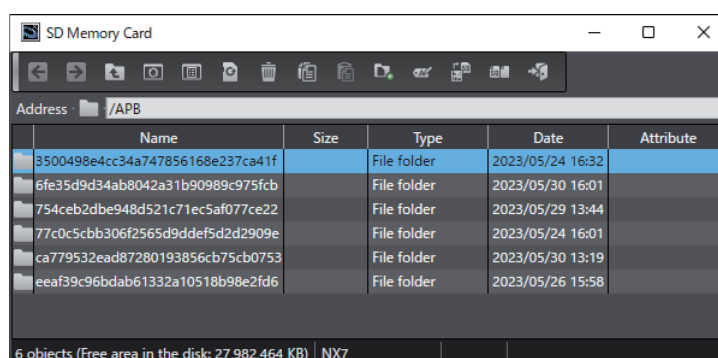
Item	Specification	Description
Video Codec	H.264	Profile level 5.1 or lower
Audio Codec	AAC	---
Container	MKV	---

### 6-1-1 Preparing Variable log

Copy variable logs from the SD Memory Card on the Controller to a computer on which the Sysmac Studio is installed.

You can copy variable logs when the Sysmac Studio is online with the Controller.

- 1 Select **Automation Playback – Get Variable Log from Controller** from the **Tools** menu of the Sysmac Studio.  
The **SD Memory Card** dialog box is displayed.



If the APB folder, which is the automation playback data folder, does not exist on the SD Memory Card, an error message will appear after this dialog box is displayed.

- 2 In the **SD Memory Card** dialog box, select and copy the target data.  
Select the variable log stored in the folder whose name matches the program hash code of the project for which the variable log was obtained.  
Refer to *NX-series CPU Unit Automation Playback User's Manual (Cat. No. W639)* for the specifications for saving variable log files.
- 3 Paste it into any folder in Windows Explorer.

The variable logs are copied to the specified folder.



Additional Information

Other methods to do so include using the Windows function to copy it to an SD Memory Card mounted on the computer or using the FTP server to copy it to the computer.

For how to use the FTP server to copy playback data to a computer, refer to the *NJ/NX-series CPU Unit Built-in EtherNet/IP Port User's Manual (Cat. No. W506)*.

For information on how to centrally manage variable logs and video data with scripts that work with the network storage, visit the following URL. Or, contact your OMRON representative.  
[https://www.ia.omron.com/product/tool/nx5\\_apb/download.htm](https://www.ia.omron.com/product/tool/nx5_apb/download.htm)

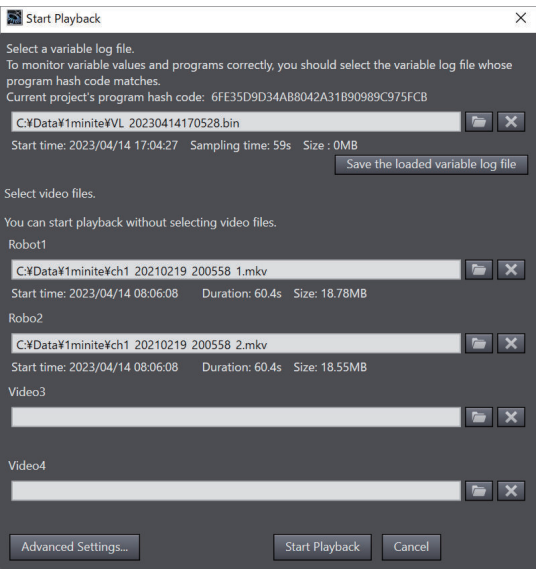
6-1-2 Procedure for Starting Playback

To start playback function, the Sysmac Studio and the Controller must be offline.

- 1 Open the project to use for playback in the Sysmac Studio.
- 2 Select **Automation Playback – Start Playback** from the **Tools** menu of the Sysmac Studio.

Or, click the **Start Playback** icon (  ) in the toolbar.

The **Start Playback** dialog box is displayed.



- 3 In the **Start Playback** dialog box, specify the variable log and video data to use for playback.
- 4 Click the **Start Playback** button.  
After a display of the **Starting Playback...** dialog box, the **Playback** dialog box and the **Search Playback Data** tab page are displayed. When video data is specified, the **Video Playback** window is displayed.



The top of the Edit pane is shown in purple.




### Additional Information

- The **Controller Status** pane is not displayed during execution of playback function.
- The **Search Playback Data** tab page is displayed in a floating state, separate from the Sysmac Studio window. You can cancel the floating state and place it in the window, and bring it back to the floating state again. Refer to the Sysmac Studio Version 1 Operation Manual (Cat. No. W504) for details.

## 6-1-3 Procedure for Ending the Playback

End the playback from the Sysmac Studio menu.

- 1 Select **Automation Playback – Exit Playback** from the **Tools** menu of the Sysmac Studio. Or, click the **Exit Playback** icon () in the toolbar.

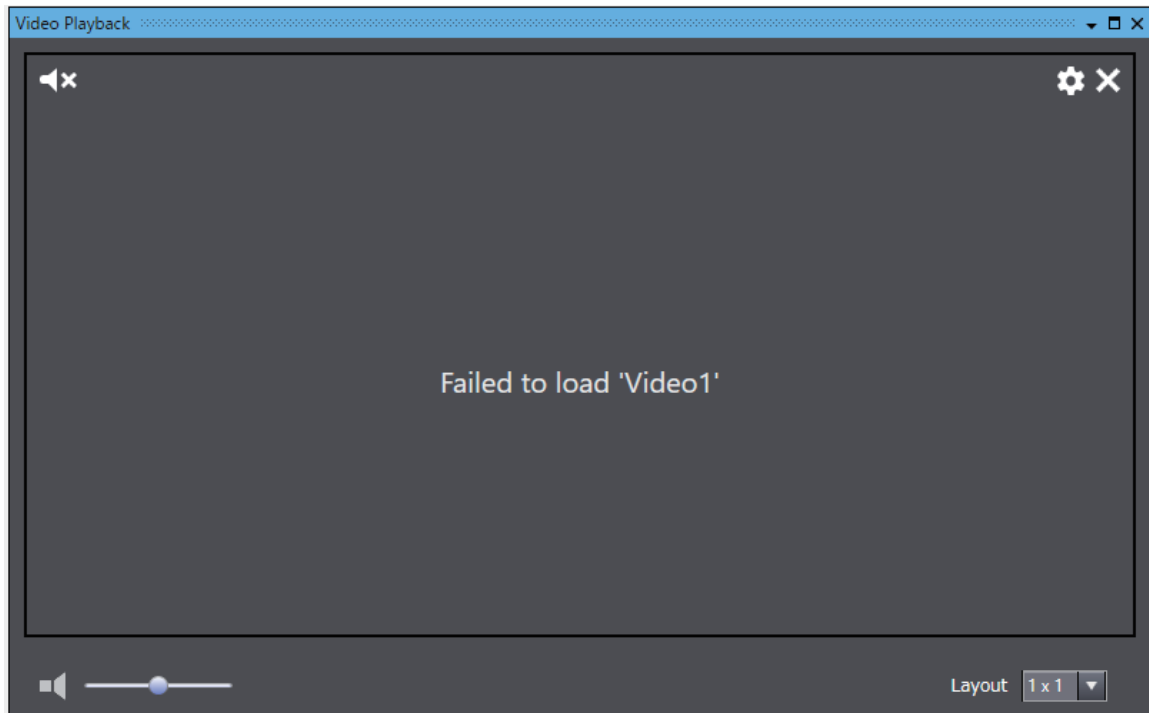
The playback function is ended after the **Playback** dialog box, the **Search Playback Data** tab page, and the **Playback Chart** window are closed.

When the playback function is ended, the Sysmac Studio goes offline from playback mode.

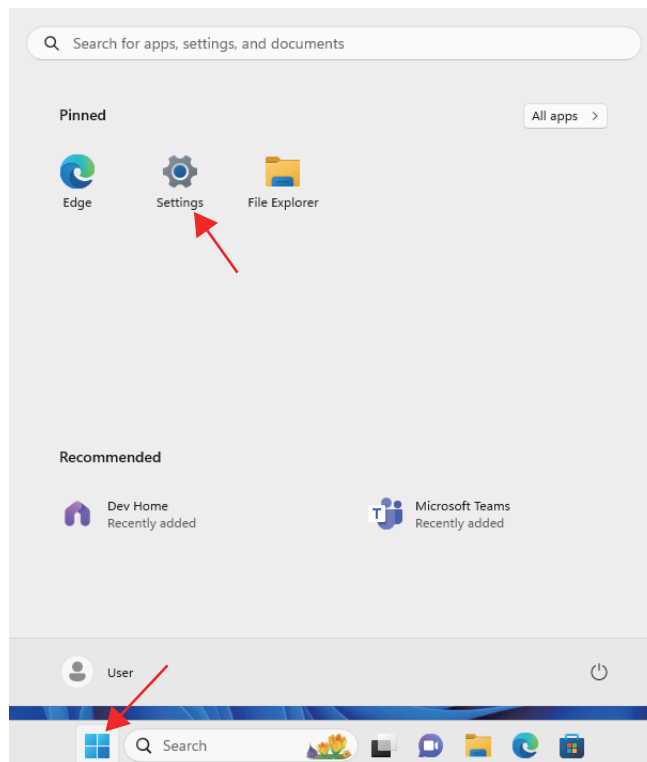


## 6-2 Troubleshooting When a Video Cannot be Played Back

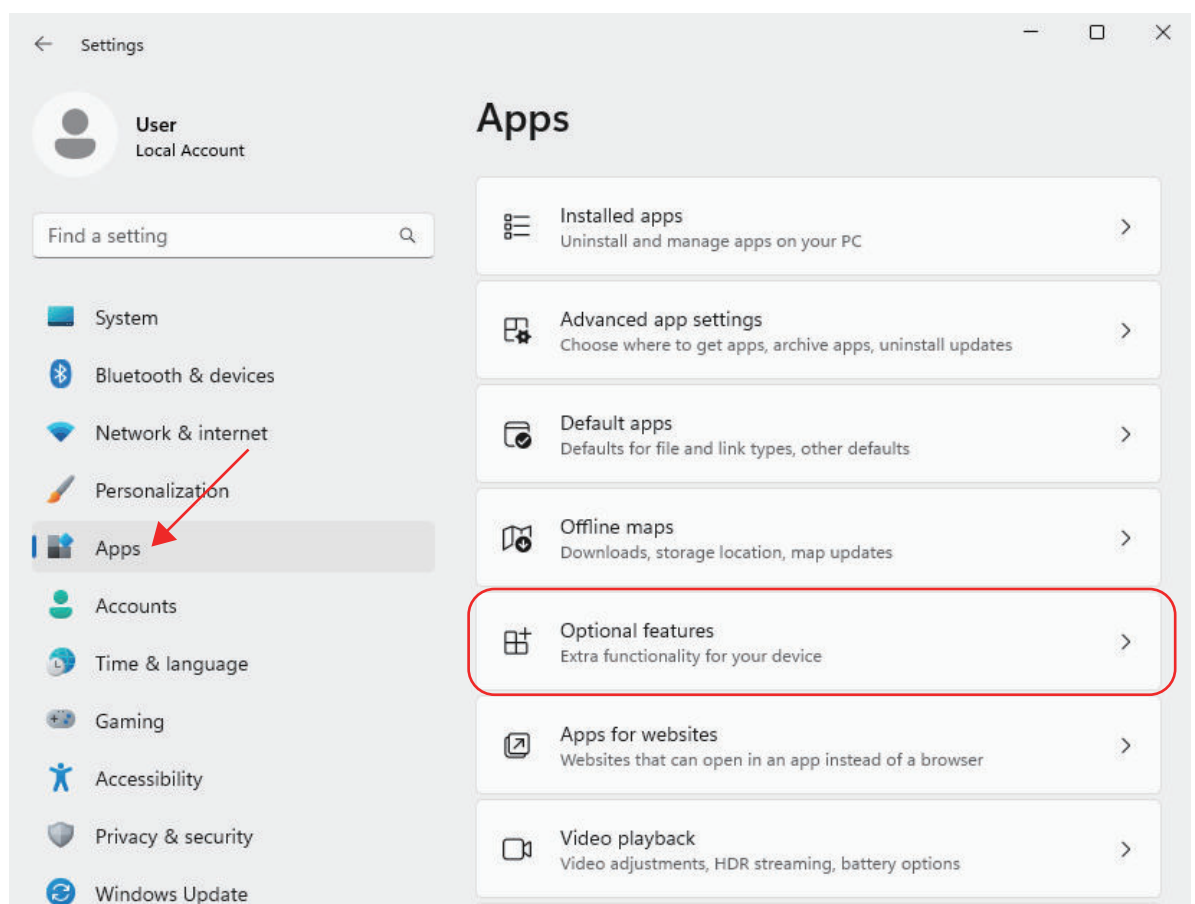
If a video file that can be played back in Sysmac Studio is not played and the message **Failed to load video** is displayed in the **Video Playback** window, troubleshoot as follows.



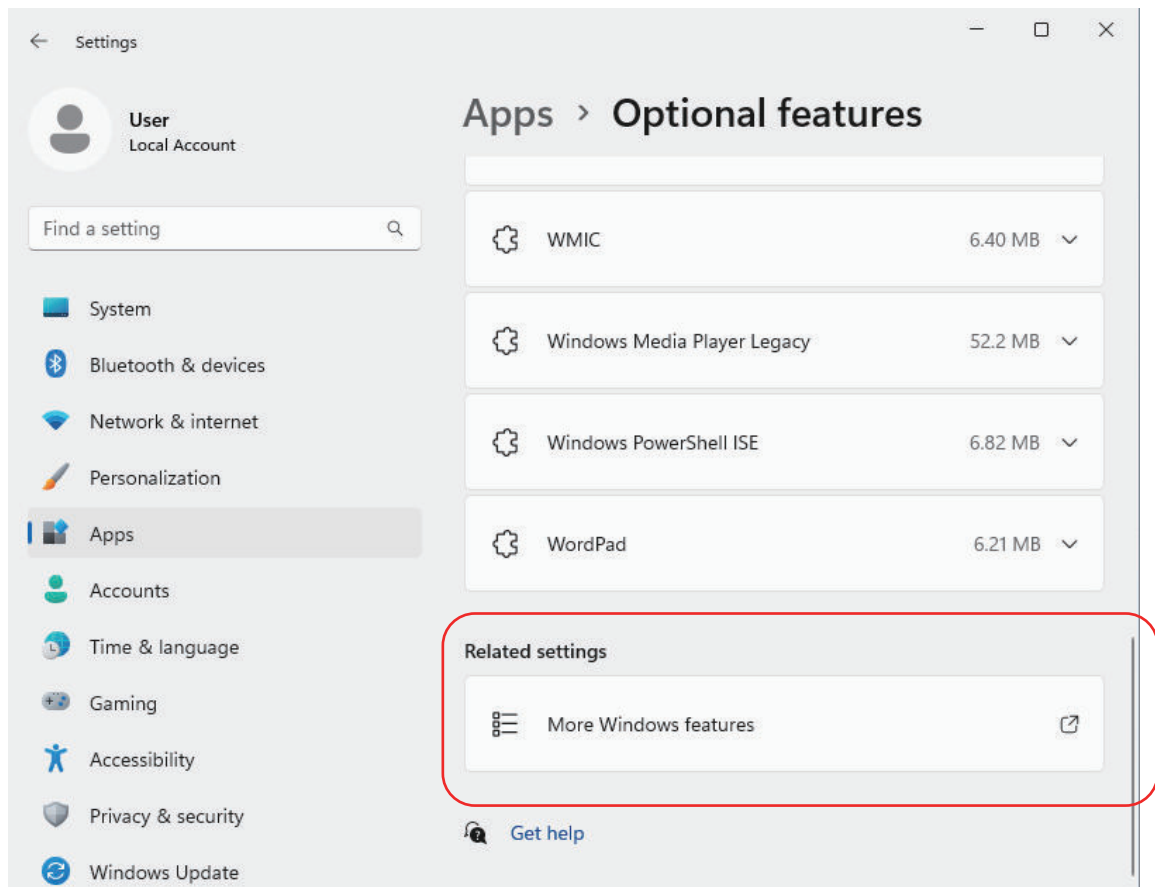
- 1** From the Windows Start menu, click **Settings**.



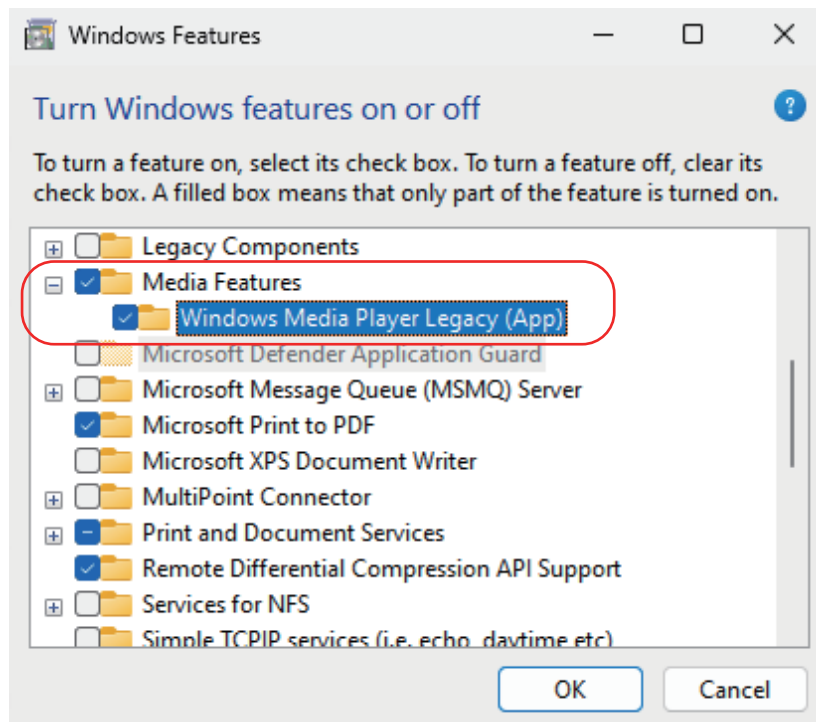
**2** Click on **Apps**, and then click **Optional features**.



- 3** Click on **More Windows features** in **Related settings** at the lower part of the **Optional features** screen.



- 4** Make sure that the check boxes for **Media Features** and **Windows Media Player** are checked in the **Windows Features** window. If they are not checked, check them and click the **OK** button.



# A1

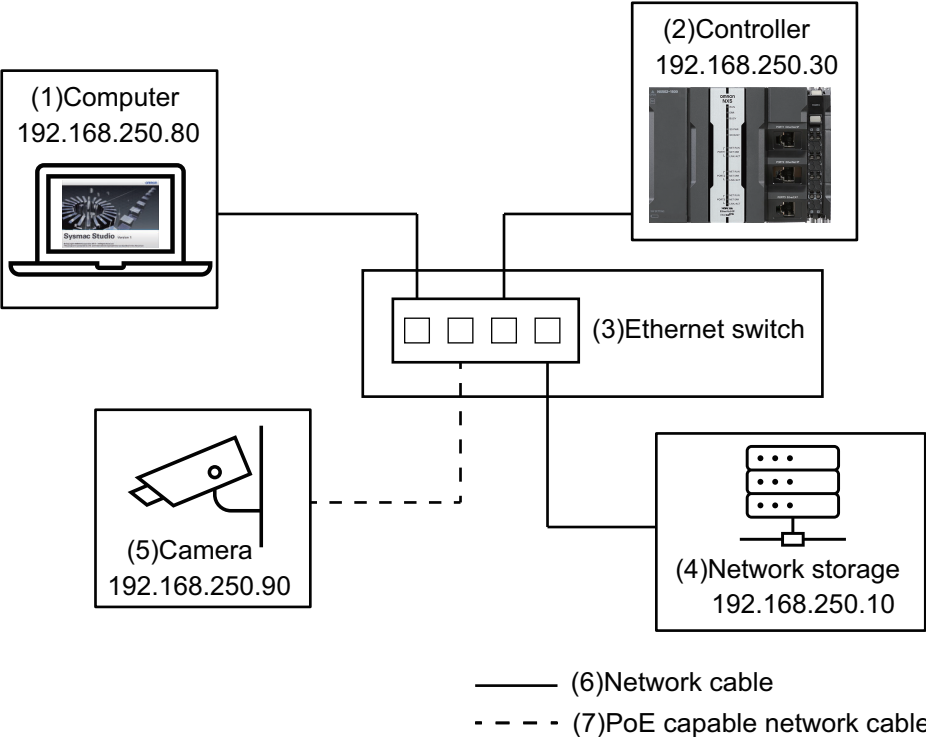
## Sample Ver.1 Detailed Description

<b>A1-1</b>	<b>System Configuration .....</b>	<b>A1-2</b>
<b>A1-2</b>	<b>Confirmed with Sample Ver.1 Camera.....</b>	<b>A1-4</b>
<b>A1-3</b>	<b>Application Procedures .....</b>	<b>A1-5</b>
<b>A1-4</b>	<b>How to Use Sample Programs .....</b>	<b>A1-6</b>
A1-4-1	Security Information .....	A1-6
A1-4-2	UpdateCameraTime .....	A1-6
A1-4-3	UpdateCameraTime2 .....	A1-9
A1-4-4	PrePostTriggerRecording .....	A1-12
A1-4-5	TriggeredIntervalRecording .....	A1-16
A1-4-6	Timing Charts .....	A1-19
A1-4-7	Troubleshooting .....	A1-20
A1-4-8	Error Codes .....	A1-21

A1

# A1-1 System Configuration

Omron has confirmed operation of the sample programs in the following system configuration.



No	Device	Description	IP address														
(1)	Computer	A computer with Sysmac Studio (version 1.55) installed	192.168.250.80														
(2)	Controller	<div>NX502-1□00 (Unit version 1.63)</div> <div>This document assumes that the following automation playback settings have been set in the Controller.</div> <div><b>Sampling Setting 1</b></div> <table><tr><th>Item</th><th>Setting</th></tr><tr><td>Trigger method</td><td>Pre/Post trigger method</td></tr><tr><td>Pre-trigger sampling time</td><td>20 seconds</td></tr><tr><td>Post-trigger sampling time</td><td>10 seconds</td></tr></table> <div><b>Sampling Setting 2</b></div> <table><tr><th>Item</th><th>Setting</th></tr><tr><td>Trigger method</td><td>Start/Save trigger method</td></tr><tr><td>Sampling time</td><td>10 seconds</td></tr></table>	Item	Setting	Trigger method	Pre/Post trigger method	Pre-trigger sampling time	20 seconds	Post-trigger sampling time	10 seconds	Item	Setting	Trigger method	Start/Save trigger method	Sampling time	10 seconds	192.168.250.30
Item	Setting																
Trigger method	Pre/Post trigger method																
Pre-trigger sampling time	20 seconds																
Post-trigger sampling time	10 seconds																
Item	Setting																
Trigger method	Start/Save trigger method																
Sampling time	10 seconds																
(3)	Ethernet switch	<div>An Ethernet switch supporting PoE is used.</div> <div>Use one that can supply sufficient power to the camera. On some Ethernet switches, some ports can supply power by PoE and some cannot.</div>	---														

No	Device	Description	IP address								
(4)	Network storage	<div>A storage for saving video files. It is connected to the camera via SMB protocols. This manual assumes that the following settings have been set.</div> <table><tr><th>Item</th><th>Setting</th></tr><tr><td>The storage folder name of video files</td><td>apb_tmp</td></tr><tr><td>User</td><td>APB</td></tr><tr><td>Password</td><td>password</td></tr></table>	Item	Setting	The storage folder name of video files	apb_tmp	User	APB	Password	password	192.168.250.10
Item	Setting										
The storage folder name of video files	apb_tmp										
User	APB										
Password	password										
(5)	Cameras	<div>Network cameras made by Axis. This manual assumes that the following settings have been set.</div> <table><tr><th>Item</th><th>Setting</th></tr><tr><td>User</td><td>root</td></tr><tr><td>Password</td><td>password</td></tr></table>	Item	Setting	User	root	Password	password	192.168.250.90		
Item	Setting										
User	root										
Password	password										
(6)	Network cables	Use Ethernet cables that can be used with the device to be connected.	---								
(7)	PoE compatible network cable	<div>Prepare a PoE-compatible network cable. It can be used for both communications and power supply. Connect this cable to the camera and a port of the Ethernet switch that can supply power by PoE.</div>	---								



Precautions for Correct Use

Specify the network storage as the camera's video file output destination. If a video file is output to the camera's SD card, the video file cannot be played on Sysmac Studio.



Additional Information

This manual provides a setting example for using a computer as a network storage device. Refer to *A2-3-1 Example of Setting to Use a Computer as Network Storage* on page A2-18 for the setting example.



Version Information

Axis camera OS version 12 or later, Axis cameras in the factory default settings are configured to accept only HTTPS communication, with HTTP communication disabled. Consider using Sample Ver. 2 of this sample program.

## A1-2 Confirmed with Sample Ver.1 Camera

The sample programs have been confirmed to work correctly with the following cameras. Omron does not guarantee the operation of those cameras.

Model	OS version	Type	Maximum resolution	Maximum fps
AXIS M3085-V	11.4.63	Dome	1920 x 1080	25/30
AXIS M3086-V	11.4.63		2688 x 1512	25/30
AXIS M3088-V	11.9.60		3840 x 2160	12/15
AXIS M3115-LVE	10.12.166		1920 x 1080	25/30
AXIS M5075-G	11.4.63	PTZ	1920 x 1080	50/60
AXIS M5525-E	8.40.19		1920 x 1080	25/30
AXIS P1245	9.80.28	Modular	1920 x 1080	25/30
AXIS P1275	9.80.28		1920 x 1080	25/30
AXIS FA1105 + AXIS FA54	11.9.60		1920 x 1080	25/30
AXIS F2105-RE + AXIS F9111	11.9.60		1920 x 1080	180
AXIS F2115-R + AXIS F9111	11.9.60		1920 x 1080	180
AXIS P1375	10.12.166	Box	1920 x 1080	50/60
	11.4.63			
AXIS P1378	11.9.60		3840 x 2160	25/30
AXIS Q1715	11.9.60		1920 x 1080	120
AXIS P3818-PVE	11.9.60	Panoramic	5120 x 2560	30
AXIS Q3819-PVE	11.7.61		4096 x 864 <sup>*1</sup>	30

\*1. Sysmac Studio cannot play videos shot at the resolution of 8192 x 1728 supported by this camera.



### Additional Information

- When you use an Axis camera that is not listed here, please refer to *A4-1 Check Items When Using Untested Cameras* on page A4-2 and test the behavior of the sample programs.
- The sample programs in this document can only control Axis cameras. To use a camera from other manufacturers, check the interfaces supported by the camera, and create your camera control programs.



# A1-3 Application Procedures

---

Use the sample programs to record a video file for variable logs and use it for playback.

- 1** Set up the camera.  
Refer to *Section 3 Camera Settings* on page 3-1 and configure the camera so that it can be controlled by the sample program.
- 2** Configure the sample program.  
Refer to *Section 4 Sample Ver.2 Usage* on page 4-1 and configure the sample program so that it can be used on your system.
- 3** Start up the peripheral devices.  
This sample program assumes that the Controller is started after the camera and network storage are booted.
- 4** Start the operation of the Controller.  
Refer to *Section 5 Controller Settings* on page 5-1 and configure the Controller so that the user program, including the sample program, is executed.  
When the trigger condition is met, the automation playback function outputs a variable log, and the camera outputs a video file to the network storage.
- 5** Playback on Sysmac Studio.  
Refer to *Section 6 Playing Back Variable Logs and Videos* on page 6-1 and start playback using variable logs and a video file.

With the above procedure, you can play the playback data in which variables and the video are linked.

# A1-4 How to Use Sample Programs

## A1-4-1 Security Information



### Precautions for Correct Use

The sample programs assume that you are using an Axis camera in a local network that is isolated from external networks. Please note that authentication information such as username and password to be registered will be included in the Sysmac Studio project without encryption. So, take the following precautionary measures.

- Do not use the username and password that are registered for the camera with the Controller or other devices.
- To protect against theft or leakage of your username and password registered for the camera, consider the following:
  - a) Set a password for your Sysmac Studio project and use the data protection feature. Reference the sample programs and describe the authentication information of the camera as a constant (literal). The initial value set in the variable is not encrypted by the data protection function.
  - b) Restrict access to the SD Memory Card to which project backups are saved and locations where backups are stored. Specifically, manage the media and entry and exit for access control.

## A1-4-2 UpdateCameraTime

### Functions

Use this program POU to set the Controller's clock time information on the camera.

- Camera's clock time can be set up to seconds.
- Before using this program POU, disable the NTP server for clock time setting of the camera, and then set the camera's time zone to match the time zone of the Controller. Refer to *A2-3-1 Example of Setting to Use a Computer as Network Storage* on page A2-18 for settings on the camera.

We tested the operation of this program POU with the following cameras.

Model	OS version	Type	UpdateCameraTime*1
AXIS M3085-V	11.4.63	Dome	Does not work
AXIS M3086-V	11.4.63		Does not work
AXIS M3088-V	11.9.60		Does not work
AXIS M3115-LVE	10.12.166		Available
AXIS M5075-G	11.4.63	PTZ	Does not work
AXIS M5525-E	8.40.19		Available
AXIS P1245	9.80.28	Modular	Available
AXIS P1275	9.80.28		Available
AXIS FA1105 + AXIS FA54	11.9.60		Does not work
AXIS F2105-RE + AXIS F9111	11.9.60		Does not work
AXIS F2115-R + AXIS F9111	11.9.60		Does not work

Model	OS version	Type	UpdateCameraTime*1
AXIS P1375	10.12.166	Box	Available
	11.4.63		Does not work
AXIS P1378	11.9.60		Does not work
AXIS Q1715	11.9.60		Does not work
AXIS P3818-PVE	11.9.60	Panoramic	Does not work
AXIS Q3819-PVE	11.7.61		Does not work

\*1. (Available: tested and normal operation has been confirmed, Does not work: tested but does not work)



### Precautions for Correct Use

Omron does not guarantee the operation of those cameras.



### Additional Information

Do not use this program POU when the NTP server is used for clock time setting on the camera.



### Version Information

If the OS version of your camera is Ver. 11.x or higher, consider using the following methods to align the clock time with the Controller.

- Use UpdateCameraTime2.(For more information, refer to A1-4-3 *UpdateCameraTime2* on page A1-9.)
- Use the NTP server instead of using this program POU.

## How to Use This Sample Program

Disable the NTP server for clock time setting of the camera, and set the camera's time zone to match the time zone of the Controller.

Refer to 3-3 *Clock Time Setting* on page 3-10 for the settings of camera clock time.

- 1 Set the input variables of the UpdateCameraTime\_instance as shown in the table below.

Input Variables	Value to be set as initial value
Username	Enter the camera's user name.
Password	Enter the password for the user name of the camera.
CameraIP	Enter the IP address of the camera.

- 2 Edit the execution conditions of the input variable *Execute* of UpdateCameraTime\_instance to suit your system.  
In the sample program, TRUE in the internal variable *ClockTrigger* is used as the condition.
- 3 Make sure that the camera and network storage have booted, and then turn ON the power supply to the Controller.

## Setting Example

Set the input variables of the internal variable *UpdateCameraTime\_instance* as shown in the table below.

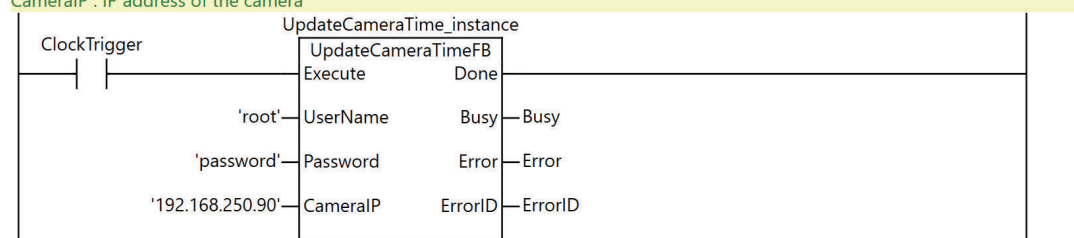
Variable	Setting example	Description
UserName	'root'	Enter the camera's user name.
Password	'password'	Enter the password for the user name of the camera.
CameraIP	'192.168.250.90'	Enter the IP address of the camera.

This program has not been tested on camera OS version 11.x. Enter the camera's authentication information and IP address as literal. Please change the following values to suit your environment.

UserName : User name of the camera

Password : Password for the camera

CameraIP : IP address of the camera



When an error occurs, *Error* will change to TRUE. For information on the error codes stored in *ErrorID*, refer to *A1-4-7 Troubleshooting* on page A1-20.

## Specifications of Function Block UpdateCameraTimeFB

This FB sets the clock time information of the Controller to the camera.

Graphic expression	ST expression
	<pre>UpdateCameraTime_instance(   Execute:=,   UserName:=,   Password:=,   CameraIP:=,   Offset:=,   Done=&gt;,   BUSY=&gt;,   Error=&gt;,   ErrorID=&gt;);</pre>

### ● Input Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial value
Execute	Execute	BOOL	True Execute False Do Not Execute	TRUE or FALSE	---	False
UserName	User name	STRING	User name registered for the camera	4 to 14 characters	---	None
Password	Password	STRING	Password registered for the camera	4 to 64 characters	---	None

Variable	Name	Data type	Description	Valid range	Unit	Initial value
CameraIP	IP address	STRING	IP address of the camera	7 to 15 characters	---	None

## ● Output Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial value
Done	Done	BOOL	True Normal end False Error end, execution in progress, or execution condition not met.	TRUE or FALSE	---	---
Busy	Executing	BOOL	True Executing False Not executing	TRUE or FALSE	---	---
Error	Error	BOOL	True Error end False Normal end, execution in progress, or execution condition not met.	TRUE or FALSE	---	---
ErrorID	Error Code	WORD	Error ID at an error end 16#0 for a normal end	16#0 to 16#FFFF	---	---

## A1-4-3 UpdateCameraTime2

### Functions

Use this program POU to set the Controller's clock time information on the camera.

- Camera's clock time can be set up to seconds.
- Before using this program POU, disable the NTP server for clock time setting of the camera, and then set the camera's time zone to match the time zone of the Controller. Refer to *A2-3-1 Example of Setting to Use a Computer as Network Storage* on page A2-18 for settings on the camera.

We tested the operation of this program POU with the following cameras.

Model	OS version	Type	UpdateCameraTime2*1
AXIS M3085-V	11.4.63	Dome	Available
AXIS M3086-V	11.4.63		Available
AXIS M3088-V	11.9.60		Available
AXIS M3115-LVE	10.12.166		Available
AXIS M5075-G	11.4.63	PTZ	Available
AXIS M5525-E	8.40.19		Does not work

Model	OS version	Type	UpdateCameraTime2 <sup>*1</sup>
AXIS P1245	9.80.28	Modular	Unconfirmed
AXIS P1275	9.80.28		Unconfirmed
AXIS FA1105 + AXIS FA54	11.9.60		Available
AXIS F2105-RE + AXIS F9111	11.9.60		Available
AXIS F2115-R + AXIS F9111	11.9.60		Available
AXIS P1375	10.12.166	Box	Available
	11.4.63		Available
AXIS P1378	11.9.60		Available
AXIS Q1715	11.9.60		Available
AXIS P3818-PVE	11.9.60	Panoramic	Available
AXIS Q3819-PVE	11.7.61		Available

\*1. (Available: tested and normal operation has been confirmed, Does not work: tested but does not work, Unconfirmed: Not yet tested)



### Precautions for Correct Use

Omron does not guarantee the operation of those cameras.



### Additional Information

Do not use this program POU when the NTP server is used for clock time setting on the camera.



### Version Information

If the OS version of your camera is lower than Ver. 10.x, consider using the following methods to align the clock time with the Controller.

- Use UpdateCameraTime.(For more information, refer to *A1-4-2 UpdateCameraTime* on page A1-6.)
- Use the NTP server instead of using this program POU.

## How to Use This Sample Program

Disable the NTP server for clock time setting of the camera, and set the camera's time zone to match the time zone of the Controller.

Refer to 3-3 *Clock Time Setting* on page 3-10 for the settings of camera clock time.

- Set the input variables of the UpdateCameraTime2\_instance as shown in the table below.

Input Variables	Value to be set as initial value
Username	Enter the camera's user name.
Password	Enter the password for the user name of the camera.
CameraIP	Enter the IP address of the camera.
TimeOffset	Set the offset from UTC, which is specified to the Controller's time zone.

- Edit the execution conditions of the input variable *Execute* of UpdateCameraTime2\_instance to suit your system.

In the sample program, the Controller's system clock time is sent to the camera on the condition that the internal variable *ClockTrigger* becomes TRUE.

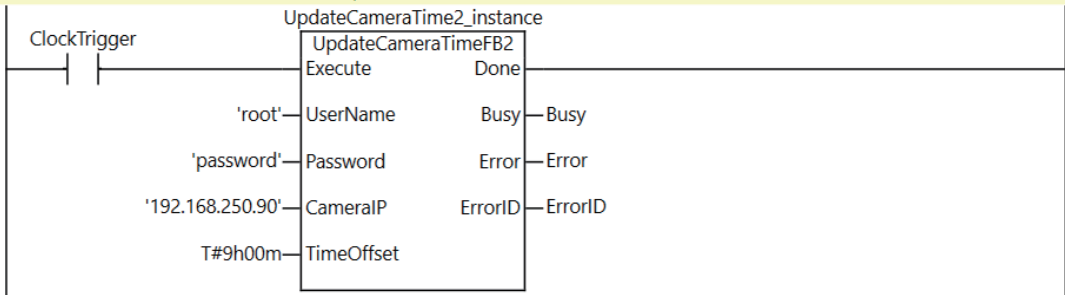
- 3
- Make sure that the camera and network storage have booted, and then turn ON the power supply to the Controller.

### Setting Example

Set the input variables of the internal variable *UpdateCameraTime2\_instance* as shown in the table below.

Variable	Setting example	Description
UserName	'root'	Enter the camera's user name.
Password	'password'	Enter the password for the user name of the camera.
CameraIP	'192.168.250.90'	Enter the IP address of the camera.
TimeOffset	T#9h00m	Set the offset from UTC, which is specified to the Controller's time zone.

This program has been tested with camera OS versions 10.x and 11.x. Enter camera credentials, IP address and offset from UTC as literal. Please change the following values to suit your environment.  
UserName : User name of the camera  
Password : Password for the camera  
CameraIP : IP address of the camera  
TimeOffset : Offset from UTC of the time zone set in the controller.  
-example  
For a time zone of UTC+9:00, set T#9h00m.  
For a time zone of UTC+5:45, set T#5h45m.  
For a time zone of UTC-9:00, set T#-9h00m.



When an error occurs, *Error* will change to TRUE. For information on the error codes stored in *ErrorID*, refer to *A1-4-7 Troubleshooting* on page A1-20.

### Specifications of Function Block UpdateCameraTimeFB2

This FB sets the clock time information of the Controller to the camera.

Graphic expression	ST expression
	<pre>UpdateCameraTime2_instance( Execute:=, Username:=, Password:=, CameraIP:=, Offset:=, Done=&gt;, BUSY=&gt;, Error=&gt;, ErrorID=&gt;);</pre>

## ● Input Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial value
Execute	Execute	BOOL	True Execute False Do Not Execute	TRUE or FALSE	---	False
UserName	User name	STRING	User name registered for the camera	4 to 14 characters	---	None
Password	Password	STRING	Password registered for the camera	4 to 64 characters	---	None
CameraIP	IP address	STRING	IP address of the camera	7 to 15 characters	---	None
TimeOffset	Time offset	TIME	Time offset from UTC (Co-ordinated Universal Time)	T#-12h00m~ T#14h00m		T#0h00m

## ● Output Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial value
Done	Done	BOOL	True Normal end False Error end, execution in progress, or execution condition not met.	TRUE or FALSE	---	---
Busy	Executing	BOOL	True Executing False Not executing	TRUE or FALSE	---	---
Error	Error	BOOL	True Error end False Normal end, execution in progress, or execution condition not met.	TRUE or FALSE	---	---
ErrorID	Error Code	WORD	Error ID at an error end 16#0 for a normal end	16#0 to 16#FFFF	---	---

## A1-4-4 PrePostTriggerRecording

### Functions

Use this program POU to save the video for a set period of time before and after the **file save trigger**. The period is specified in the camera's recording rule.

We tested the operation of this program POU with the following cameras.



Model	OS version	Type	PrePostTriggerRecording <sup>*1</sup>
AXIS M3085-V	11.4.63	Dome	Available
AXIS M3086-V	11.4.63		Available
AXIS M3088-V	11.9.60		Available
AXIS M3115-LVE	10.12.166		Available
AXIS M5075-G	11.4.63	PTZ	Available
AXIS M5525-E	8.40.19		Available
AXIS P1245	9.80.28	Modular	Available
AXIS P1275	9.80.28		Available
AXIS FA1105 + AXIS FA54	11.9.60		Available
AXIS F2105-RE + AXIS F9111	11.9.60		Available
AXIS F2115-R + AXIS F9111	11.9.60		Available
AXIS P1375	10.12.166	Box	Available
	11.4.63		Available
AXIS P1378	11.9.60		Available
AXIS Q1715	11.9.60		Available
AXIS P3818-PVE	11.9.60	Panoramic	Available
AXIS Q3819-PVE	11.7.61		Available

\*1. (Available: tested and normal operation has been confirmed, Does not work: tested but does not work)



### Precautions for Correct Use

Omron does not guarantee the operation of those cameras.



### Additional Information

Depending on the camera model, video resolution, frame rate and other settings, and subject conditions, recorded video may be shorter than the time set in the **Prebuffer** time.



### Version Information

We have confirmed that the upper limit value that can be set for the **Prebuffer** time varies depending on the OS version of the camera.

OS version	Prebuffer set value (upper limit)
8.40.19	9999 seconds
9.80.28	59 seconds
10.12.166	59 seconds
11.4.63	99 seconds

## How to Use This Sample Program

Create **recording rules** of the camera with settings that match the Controller's **Pre/Post trigger** method in advance.

Refer to *3-5-2 Configuring Recording Rules and Assigning Virtual Input* on page 3-18 for settings of the camera.

- 1 Set the following for each input variable of PrePostTriggerRecording\_ins.

Input Variables	Value to be set as initial value
Username	Enter the camera's user name.
Password	Enter the password for the user name of the camera.
CameraIP	Enter the IP address of the camera.
CameraPortNo	Specify the virtual input port number of the camera to which the created recording rule is assigned. This sample program assumes that the camera's virtual input port "1" is assigned to the recording rule that uses <b>Pre/Post trigger</b> method.

- 2 Edit the execution conditions of the input variable *Execute* of *PrePostTriggerRecording\_ins* to suit your system.  
This sample program controls the virtual input of the camera so that the video is saved in accordance with the **Pre/Post trigger** method set in the **sampling setting 1** in the Controller, using TRUE in the global variable *PrePostTrigger* as a condition.
- 3 Make the execution conditions of the input variable *Execute* of *PrePostTriggerRecording\_ins* satisfied while the camera and network storage have booted.

## Setting Example

Set the input variables of the internal variable *PrePostTriggerRecording\_ins* as shown in the table below.

Variable	Setting example	Description
UserName	'root'	Enter the camera's user name.
Password	'password'	Enter the password for the user name of the camera.
CameraIP	'192.168.250.90'	Enter the IP address of the camera.
CameraPort-No	10#1	Specify the virtual input port number of the camera to which the created recording rule is assigned. This sample program assumes that the camera's virtual input port "1" is assigned to the recording rule that uses <b>Pre/Post trigger</b> method.

For Pre/Post Trigger method.

Enter the camera's authentication information, IP address and virtual input port number as literal.

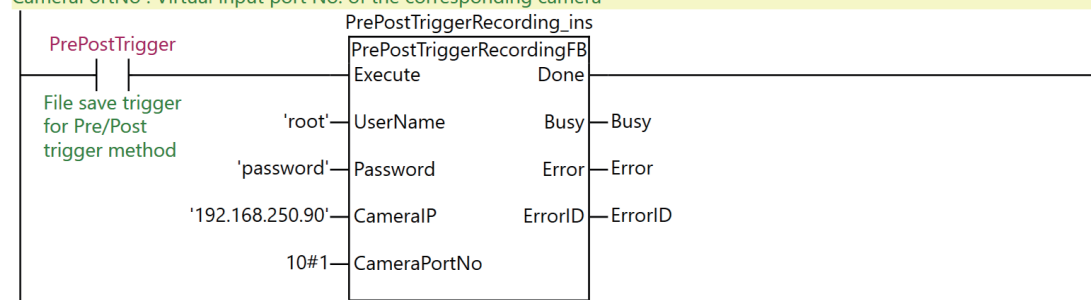
Change the following values to suit your environment.

UserName : User name of the camera

Password : Password for the camera

CameraIP : IP address of the camera

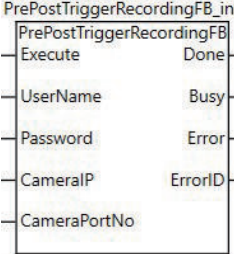
CameraPortNo : Virtual input port No. of the corresponding camera



When an error occurs, *Error* will change to TRUE. For information on the error codes stored in *ErrorID*, refer to A1-4-7 *Troubleshooting* on page A1-20.

## Specification of Function Block PrePostTriggerRecordingFB

Use this FB to record the video of the Pre/Post trigger method.

Graphic expression	ST expression
	<pre>PrePostTriggerRecordingFB_ins( Execute:=, UserName:=, Password:=, CameralP:=, CameraPortNo:=, Done=&gt;, BUSY=&gt;, Error=&gt;, ErrorID=&gt;);</pre>

### ● Input Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial value
Execute	Execute	BOOL	True Execute False Do Not Execute	TRUE or FALSE	---	False
UserName	User name	STRING	User name registered for the camera	4 to 14 characters	---	None
Password	Password	STRING	Password registered for the camera	4 to 64 characters	---	None
CameralP	IP address	STRING	IP address of the camera	7 to 15 characters	---	None
Camera-PortNo	Virtual input port	INT	Virtual input port of the camera	1 to 32	---	None

### ● Output Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial value
Done	Done	BOOL	True Normal end False Error end, execution in progress, or execution condition not met.	TRUE or FALSE	---	---
Busy	Executing	BOOL	True Executing False Not executing	TRUE or FALSE	---	---
Error	Error	BOOL	True Error end False Normal end, execution in progress, or execution condition not met.	TRUE or FALSE	---	---
ErrorID	Error Code	WORD	Error ID at an error end 16#0 for a normal end	16#0 to 16#FFFF	---	---

## A1-4-5 TriggeredIntervalRecording

### Functions

Use this program POU to save the video for the collection time set in the Variable log output settings.

The saved video starts when the start trigger rises.

We tested the operation of this program POU with the following cameras.

Model	OS version	Type	TriggeredIntervalRecording <sup>*1</sup>
AXIS M3085-V	11.4.63	Dome	Available
AXIS M3086-V	11.4.63		Available
AXIS M3088-V	11.9.60		Available
AXIS M3115-LVE	10.12.166		Available
AXIS M5075-G	11.4.63	PTZ	Available
AXIS M5525-E	8.40.19		Available
AXIS P1245	9.80.28	Modular	Available
AXIS P1275	9.80.28		Available
AXIS FA1105 + AXIS FA54	11.9.60		Available
AXIS F2105-RE + AXIS F9111	11.9.60		Available
AXIS F2115-R + AXIS F9111	11.9.60		Available
AXIS P1375	10.12.166	Box	Available
	11.4.63		Available
AXIS P1378	11.9.60		Available
AXIS Q1715	11.9.60		Available
AXIS P3818-PVE	11.9.60	Panoramic	Available
AXIS Q3819-PVE	11.7.61		Available

\*1. (Available: tested and normal operation has been confirmed, Does not work: tested but does not work)



#### Precautions for Correct Use

Omron does not guarantee the operation of those cameras.



#### Additional Information

The variable log of the automation playback is output only when the **file save trigger** is established. However, this sample program saves video for the period that the **start trigger** is ON, regardless of the state of the **file save trigger**.

### How to Use This Sample Program

Create **recording rules** of the camera with settings that match the Controller's **Start/Save trigger** method in advance.

Refer to *3-5-2 Configuring Recording Rules and Assigning Virtual Input* on page 3-18 for settings of the camera.

- 1 Set the following for each input variable of TriggeredIntervalRecording\_ins.

Input Variables	Value to be set as initial value
Username	Enter the camera's user name.
Password	Enter the password for the user name of the camera.
CameraIP	Enter the IP address of the camera.
CameraPort-No	Specify the virtual input port number of the camera to which the created recording rule is assigned. This sample program assumes that the camera's virtual input port "2" is assigned to the recording rule that uses <b>Start/Save trigger</b> method.
IntervalTime	Set the same time in seconds as <b>Sampling time</b> specified in the <b>Variable log output settings</b> of the <b>Start/Save trigger</b> method. This sample program assumes that the <b>Sampling time</b> in the <b>Variable log output settings</b> of the <b>Start/Save trigger</b> method in the Controller is set to 10 seconds.

- 2 Edit the execution conditions of the input variable *Execute* of *TriggerIntervalRecording\_ins* to suit your system.  
This sample program control the virtual input of the camera so that the video is saved in accordance with the **Start/Save trigger** method set in the **sampling setting 1** in the Controller, using TRUE in the global variable *StartTrigger* as a condition.
- 3 Make the execution conditions of the input variable *Execute* of *TriggerrIntervalRecording\_ins* satisfied while the camera and network storage have booted.

## Setting Example

Set the input variables of the internal variable *TriggeredIntervalRecordingFB\_ins* as shown in the table below.

Variable	Setting example	Description
UserName	'root'	Enter the camera's user name.
Password	'password'	Enter the password for the user name of the camera.
CameraIP	'192.168.250.90'	Enter the IP address of the camera.
Camera-PortNo	10#2	Specify the virtual input port number of the camera to which the created recording rule is assigned. This sample program assumes that the camera's virtual input port "2" is assigned to the recording rule that uses <b>Start/Save trigger</b> method.
IntervalTime	T#10	Set the same time in seconds as <b>Sampling time</b> specified in the <b>Variable log output settings</b> of the <b>Start/Save trigger</b> method. This sample program assumes that the <b>Sampling time</b> in the <b>Variable log output settings</b> of the <b>Start/Save trigger</b> method in the Controller is set to 10 seconds.

For Start/Save method.

Enter camera credentials, IP address, virtual input port number and collection time as literal.

Please change the following values to suit your environment.

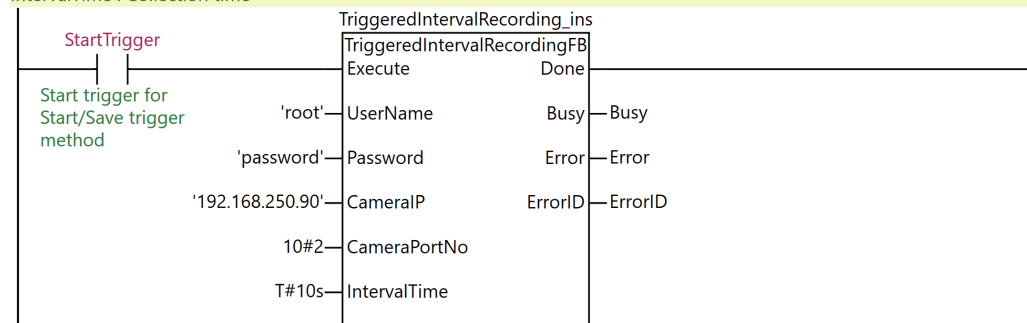
UserName : User name of the camera

Password : Password for the camera

CameraIP : IP address of the camera

CameraPortNo : Virtual input port number of the corresponding camera

IntervalTime : Collection time



When an error occurs, *Error* will change to TRUE. For information on the error codes stored in *ErrorID*, refer to *A1-4-7 Troubleshooting* on page A1-20.

## Specification of Function Block TriggeredIntervalRecordingFB

Use this FB to record the video of the Start/Save trigger method.

Graphic expression	ST expression
	<pre>TriggeredIntervalRecordingFB_ins( Execute:=, UserName:=, Password:=, CameraIP:=, CameraPortNo:=, Done=&gt;, BUSY=&gt;, Error=&gt;, ErrorID=&gt;);</pre>

### ● Input Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial value
Execute	Execute	BOOL	True Execute False Do Not Execute	TRUE or FALSE	---	False
CameraIP	IP address	STRING	IP address of the camera	7 to 15 characters	---	None
UserName	User name	STRING	User name registered for the camera	4 to 14 characters	---	None
Password	Password	STRING	Password registered for the camera	4 to 64 characters	---	None
CameraPort-No	Virtual input port	INT	Virtual input port of the camera	1 to 32	---	None
IntervalTime	Sampling time	TIME	Record time of video	Depends on data type.		

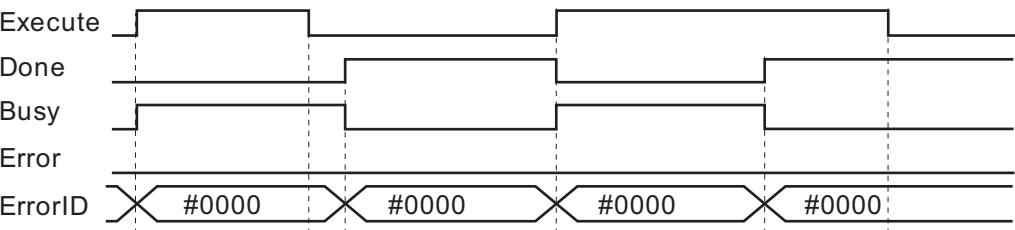
● Output Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial value
Done	Done	BOOL	True Normal end False Error end, execution in progress, or execution condition not met.	TRUE or FALSE	---	---
Busy	Executing	BOOL	True Executing False Not executing	TRUE or FALSE	---	---
Error	Error	BOOL	True Error end False Normal end, execution in progress, or execution condition not met.	TRUE or FALSE	---	---
ErrorID	Error Code	WORD	Error ID at an error end 16#0 for a normal end	16#0 to 16#FFFF	---	---

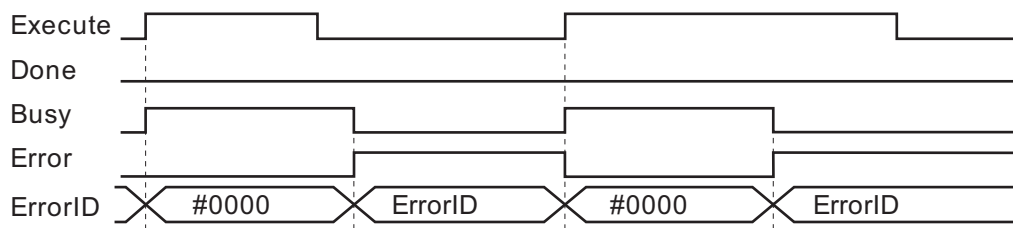
A1-4-6 Timing Charts

- All function block POUs in the sample program run as follows.
- *Busy* (Executing) changes to TRUE when *Execute* changes to TRUE.
  - When the response from the camera is received successfully, *Done* changes to TRUE.
  - If an error occurs during execution, *Error* changes to TRUE, and *Busy* (Executing) changes to FALSE. You can find out the cause of the error by accessing the value output to *ErrorID* (Error Code). For details, refer to the A1-4-8 Error Codes on page A1-21.
  - Even if *Execute* changes to FALSE before executing finish, processing will continue until it ends normally or abnormally.
  - Even if *Execute* changes to FALSE after completion of execution, the output variable is not updated.
  - After execution is completed, the output variable is initialized at the same time as detection of the rising edge of *Execute*.

Timing Chart for Normal End



Timing Chart for Error End



## A1-4-7 Troubleshooting

Function block POUs used in the sample programs provide error status using the error codes in the table below. If an error occurs, take measures according to the error code.

- Error codes common to sample programs

Error code	Status	Description	Correction
16#0000	Normal end	---	---
16#2003	Socket Status Error	The status was not suitable for execution of the socket service instruction.	Refer to the <i>Machine Automation Controller Troubleshooting Manual (Cat. No. W503)</i> for the event code with 5401 appended to the upper 4 digits of the Error code. For example, if the error code is 16#2003, refer to the description of event code 54012003 hex in the manual.
16#2006	Socket Time-out	A timeout occurred for a socket service instruction.	
16#2007	Socket Handle Out of Range	The handle that is specified for the socket service instruction is not correct.	
16#2008	Socket Communications Resource Overflow	The maximum resources that you can use for socket service instructions at the same time was exceeded.	
16#2009	Authentication failed	Authentication of the camera failed.	Check if your camera supports digest authentication. Confirm the variable values of the user name and password you set match the user name and password set on the camera.
16#2010	Invalid number of characters in IP address, username, or password, or incorrect virtual input port number	Setting value is out of range	Check if the number of characters in IP address, user-name, and password you have set are within the valid range below. <ul style="list-style-type: none"> <li>• IP address: 7 to 15 characters</li> <li>• Username: 4 to 14 characters</li> <li>• Password: 4 to 64 characters</li> </ul> Check if the virtual input port number is correct. <ul style="list-style-type: none"> <li>• Port No.: 1 to 32</li> </ul>



## A1-4-8 Error Codes

All function block POUs in the sample program show error status using the error codes in the table below.

Error code	Status	Description	Correction
16#0000	Normal end	---	---
16#2003	Socket Status Error	The status was not suitable for execution of the socket service instruction.	Refer to the <i>Machine Automation Controller Troubleshooting Manual (Cat. No. W503)</i> for the event code with 5401 appended to the upper 4 digits of the Error code. For example, if the error code is 16#2003, refer to the description of event code 54012003 hex in the manual.
16#2006	Socket Timeout	A timeout occurred for a socket service instruction.	
16#2007	Socket Handle Out of Range	The handle that is specified for the socket service instruction is not correct.	
16#2008	Socket Communications Resource Overflow	The maximum resources that you can use for socket service instructions at the same time was exceeded.	
16#2009	Authentication failed	Authentication of the camera failed.	Check if your camera supports digest authentication. Confirm the variable values of the user name and password you set match the user name and password set on the camera.
16#2010	Invalid number of characters in IP address, username, or password, or incorrect virtual input port number	Setting value is out of range	Check if the number of characters in IP address, username, and password you have set are within the valid range below. <ul style="list-style-type: none"> <li>• IP address: 7 to 15 characters</li> <li>• Username: 4 to 14 characters</li> <li>• Password: 4 to 64 characters</li> </ul> Check if the virtual input port number is correct. <ul style="list-style-type: none"> <li>• Port No.: 1 to 32</li> </ul>



# A2

## Setting Examples

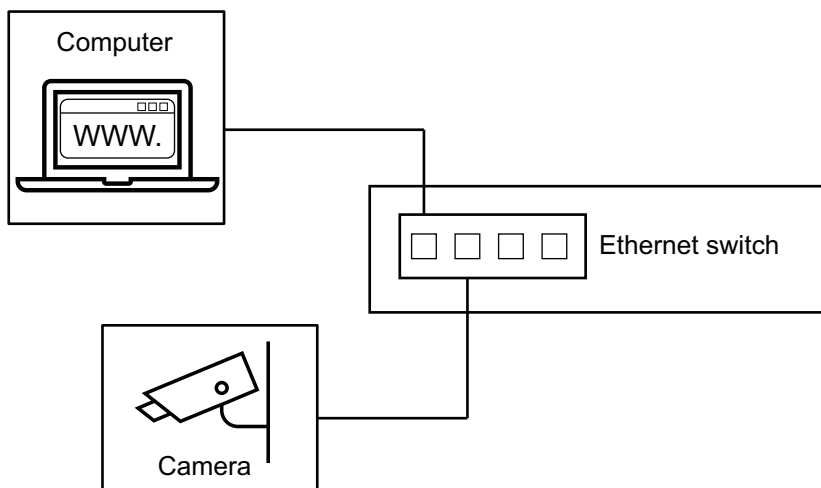
This section describes the configuration example for Axis cameras and computers.

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<b>A2-1</b>	<b>Example of Settings for Camera OS Version 8.40.8 (M5525-E)</b>	<b>A2-2</b>
A2-1-1	Initial Setting of Cameras	A2-2
A2-1-2	Clock Time Setting	A2-5
A2-1-3	Setting the Storage of Video Files	A2-6
A2-1-4	Configuring Virtual Input	A2-8
A2-1-5	Restarting the Camera and Checking the Settings	A2-14
<b>A2-2</b>	<b>Example of Video Recording Settings with a High Frame Rate</b>	<b>A2-15</b>
<b>A2-3</b>	<b>Examples of Computer Settings</b>	<b>A2-18</b>
A2-3-1	Example of Setting to Use a Computer as Network Storage	A2-18
A2-3-2	Example of Changing IP Address of a Computer	A2-27

## A2-1 Example of Settings for Camera OS Version 8.40.8 (M5525-E)

To use the sample programs, the camera must be configured in advance. Use the web browser on your computer to set up the camera.



This section describes how to set up the following camera model as an example.

OS version	Camera model
8.40.19	AXIS M5525-E

### A2-1-1 Initial Setting of Cameras

Use your computer's web browser to set up the camera. When starting up the camera for the first time, registration of user information and network settings such as an IP address are required. After the configuration, you can access the camera with user name and password.

This section gives an example of how to set up the camera using Microsoft Edge.

- 1 Set the IP address of the computer to have the same network address as the camera, which is the initial IP address of the camera to be connected.

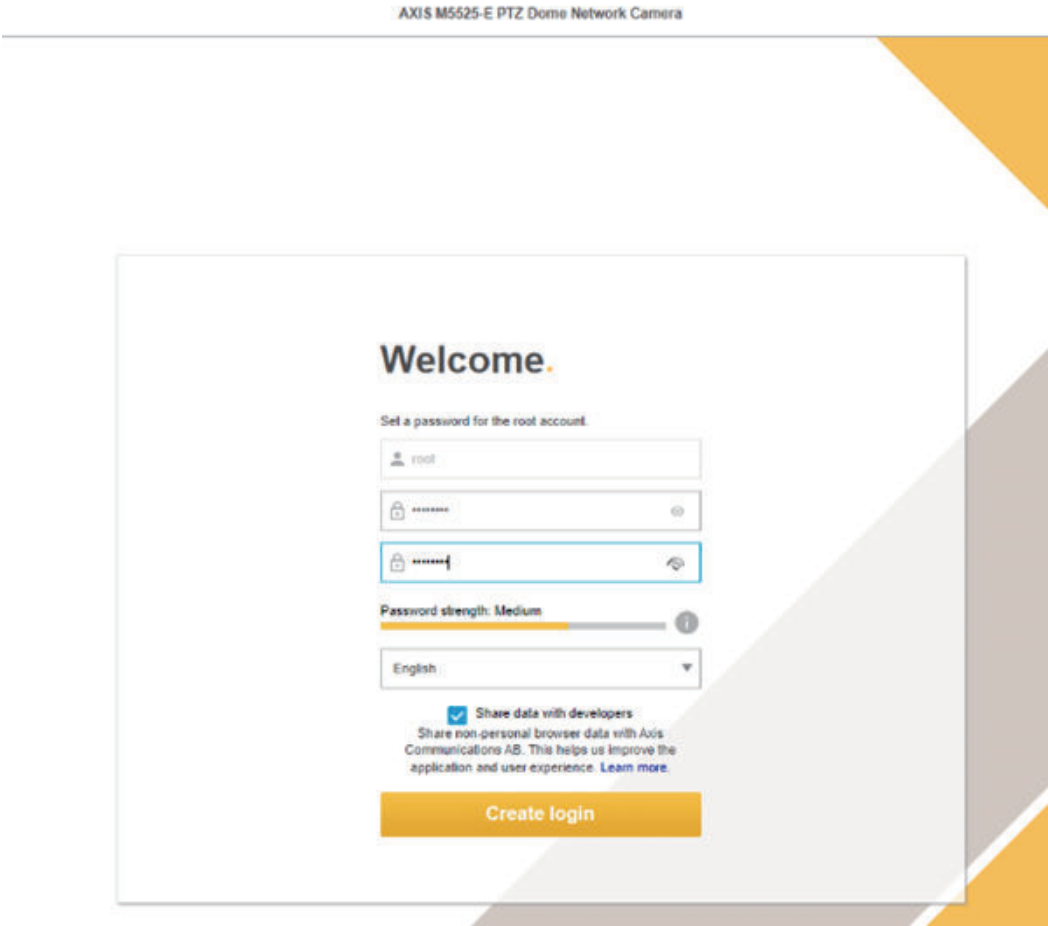
In this example, the computer's network settings will be as shown in the table below.

IP address	Subnet mask
192.168.0.80	255.255.255.0

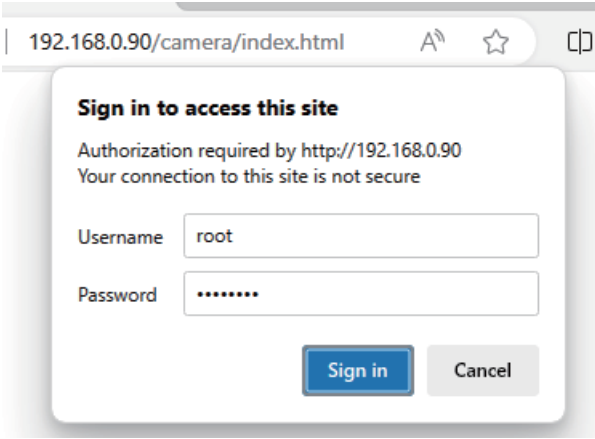
- 2 Enter the IP address of the camera in the browser.  
In this example, enter 192.168.0.90.



- 3 Enter the password you want to set for the root account, select the language you want to use, and click the **Create login** button.



- 4** Log into the camera with the root account.  
Enter "root" as the **Username** and the **Password** you set in the previous step, and then click the **Sign in** button.



- 5** On the **Get started** window, specify the following and click the **Next** button.

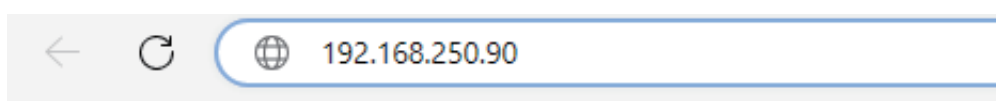
Item	Subitem	Set value	Note
IPv4		Manual IP and manual DNS	---
	IP address	192.168.250.90	Set up the camera to have the same network address as the Controller and network storage.
	Subnet mask	255.255.255.0	

Item	Subitem	Set value	Note
Date and time	Automatic date and time	OFF	---
	Use 24-hour format	Select this check box.	---
	Time zone	GMT+09 (Osaka, Sapporo, Tokyo, Seoul)	Please set it to the same time zone as the Controller setting.

- 6** If the connection with the camera is lost by configuring the camera's network settings, edit the computer's IP address so that the computer has the same network address as the camera. Here, since the network address of the camera was changed from 192.168.0.X to 192.168.250.X, specify the computer's network address to 192.168.250.X.

IP address	Subnet mask
192.168.250.80	255.255.255.0

- 7** Enter the camera's IP address in the browser to access the camera. Then, the Live View window is displayed. In this example, specify the IP address 192.168.250.90 that was set to the camera.



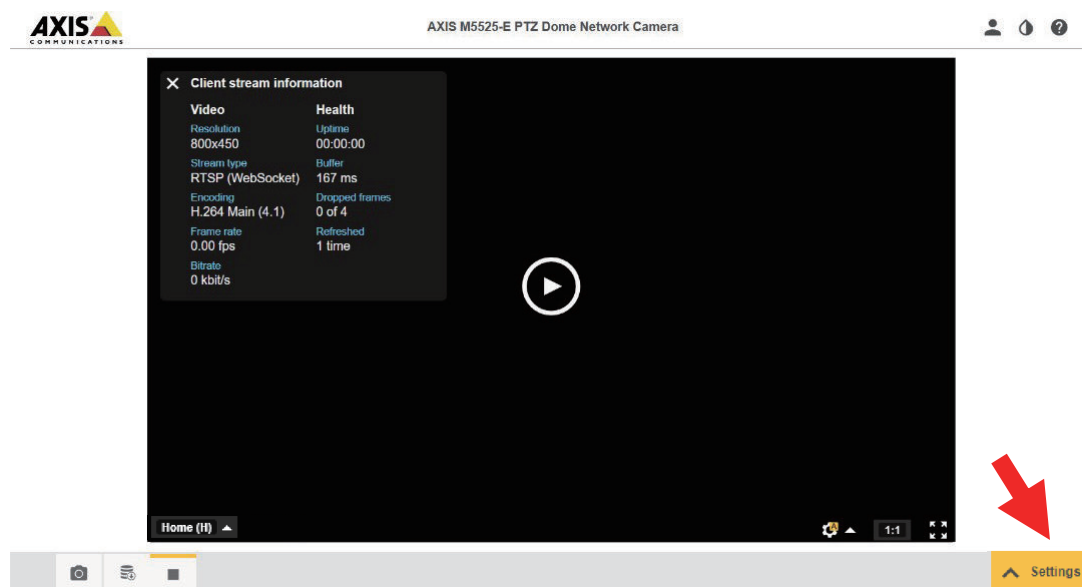
On the Live View window, you can change the camera settings and adjust position while checking the image.

## A2-1-2 Clock Time Setting

When you use the sample program "UpdateCameraTime" to align the clock time of the camera and the Controller, perform the following settings.

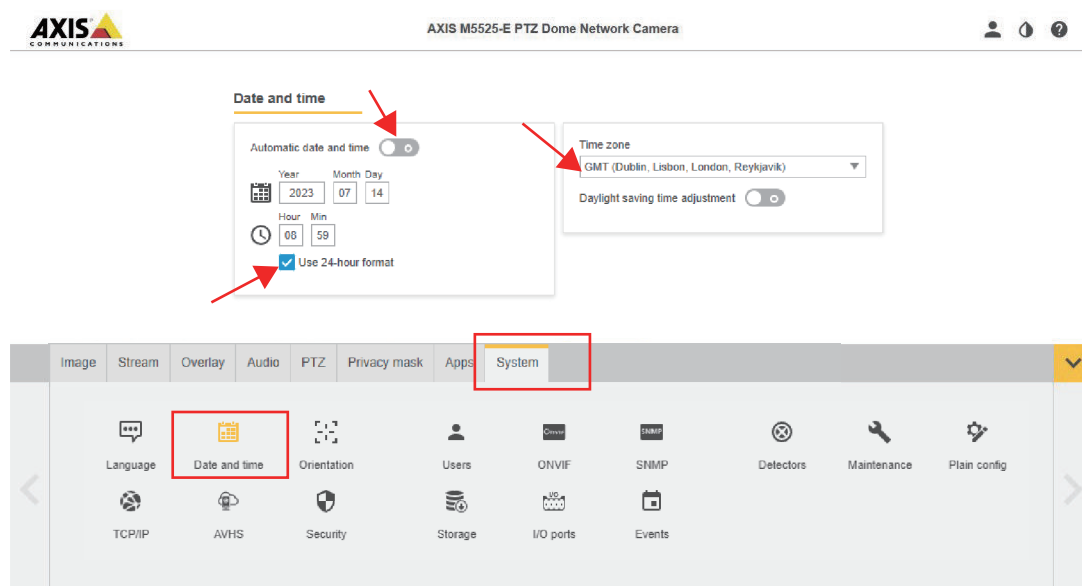
- Do not use the NTP server for the camera's clock setting.
- Match the time zone of the camera with the time zone set in the Controller.

**1** Click the **Settings** button at the bottom right of the Live View window.



**2** Click on the **System** tab, and then click **Date and time**.  
Perform the following settings.

- Disable **Automatic date and time** setting.
- Select the **Use 24-hour format** check box.
- Select the **Time zone** that is set for the Controller.



The automatic date and time setting on the camera is disabled. You can set the Controller's clock time to the camera with the sample program "UpdateCameraTime".

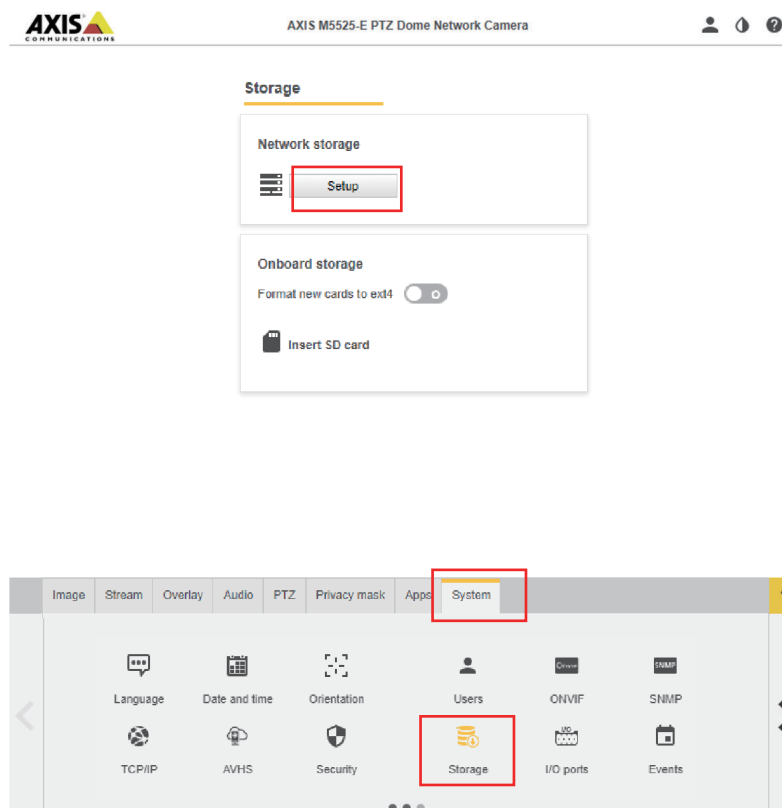


### Precautions for Correct Use

If you do not use the sample program "UpdateCameraTime", set up the camera to use the same NTP server as the Controller. Otherwise, you cannot play video correctly in Sysmac Studio.

## A2-1-3 Setting the Storage of Video Files

- 1 Click **Storage** on the **System** tab in Live View to open the storage settings menu. Click the **Setup** button in **Network storage**.



- 2 Enter the IP address of the network storage in the **Host** field and the name of the shared folder in the **Share** field.



## Storage

The screenshot shows the 'Storage' settings page. Under 'Network storage', the 'Host' field contains '192.168.250.10' and the 'Share' field contains 'apb\_tmp'. The 'The share requires login' toggle is currently turned off. There are 'Cancel' and 'Connect' buttons. Under 'Onboard storage', the 'Format new cards to ext4' toggle is also turned off, and there is an 'Insert SD card' button with an SD card icon.

### 3 Select **The share requires login** check box.

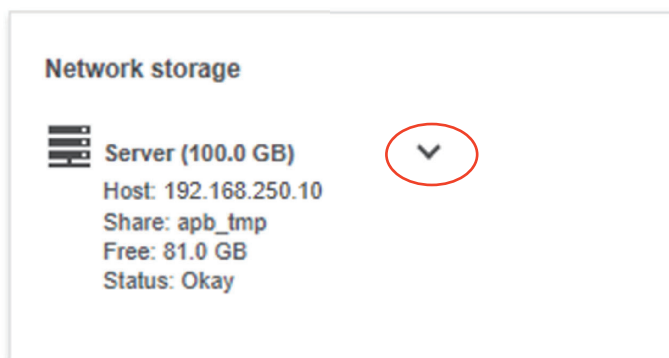
The network storage settings are displayed. Enter the login ID and password of the network storage in the **Username** and **Password**, and then click the **Connect** button.

## Storage

This screenshot shows the 'Storage' settings page after step 3. The 'The share requires login' toggle is now turned on (indicated by a blue circle with a white 'I'). The 'Username' field contains 'APB' and the 'Password' field contains '\*\*\*\*\*'. A red arrow points to the 'Connect' button. The 'Host' and 'Share' fields remain '192.168.250.10' and 'apb\_tmp' respectively.

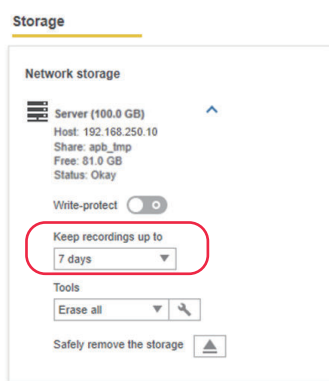
### 4 When the connection to the storage is established, the status will be **Okay**. Click the **V** mark to the right of the **Server**.

## Storage



- 5 Specify the period to keep the recorded video in the **Keep recordings up to** menu.

AXIS M5525-E PTZ Dome Network Camera



### Precautions for Correct Use

When the period specified here has elapsed, the recorded video files will be automatically deleted. Please keep backups or take other measures as needed.

## A2-1-4 Configuring Virtual Input

You can set up recording rules according to the virtual input status of the Axis camera. The sample programs control camera recording from the Controller by controlling ON/OFF of the camera's virtual input. Follow the steps below to configure the recording rules according to the virtual input status.

- 1 Configure the stream profile.  
This include settings for video file quality, such as video resolution, frame rate, etc.  
*3-5-1 Setting Stream Profile* on page 3-15
- 2 Configure the recording rule.

Create a recording rule, assign a virtual input port, and specify a stream profile that you have previously set. Also, set the conditions to record videos and output storage of video files.

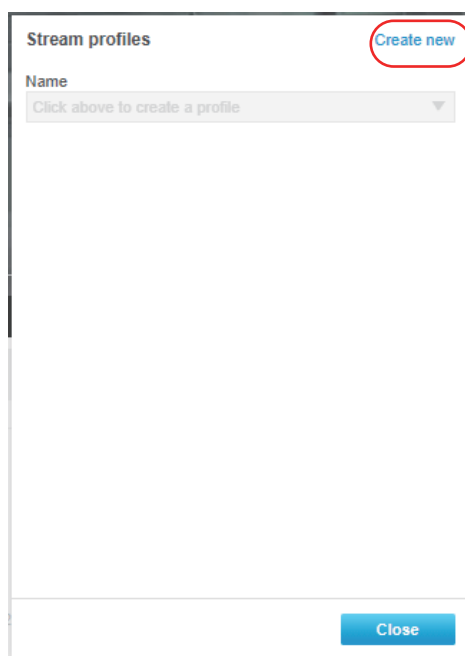
3-5-2 *Configuring Recording Rules and Assigning Virtual Input* on page 3-18

## Setting Stream Profile

Configure the profile of the video to be recorded. You can create multiple profiles and name as you like.

You will specify the profile you set up in this section later in the recording rule settings.

- 1 On the Live View window, click the **Settings - Streams** tab, and then click **Stream profiles**.
- 2 Click **Create new** in the **Stream profiles** window.



- 3 Enter name of profile, select **H.264** for the video codec, configure the resolution and other items, and click the **Create** button.

New profile

Name

NewProfile

Description

☒ H.264 ☐ MJPEG

General

Resolution

1920x1080 (16:9)

Frame rate

0 [0..30] (0 = ∞) fps

Compression

0 [0..100]

Encoding

Audio

Subtitle

Cancel

Create



Precautions for Correct Use

To play videos in Sysmac Studio, set the video codec to H.264. Sysmac Studio cannot play videos recorded with video codecs other than H.264.

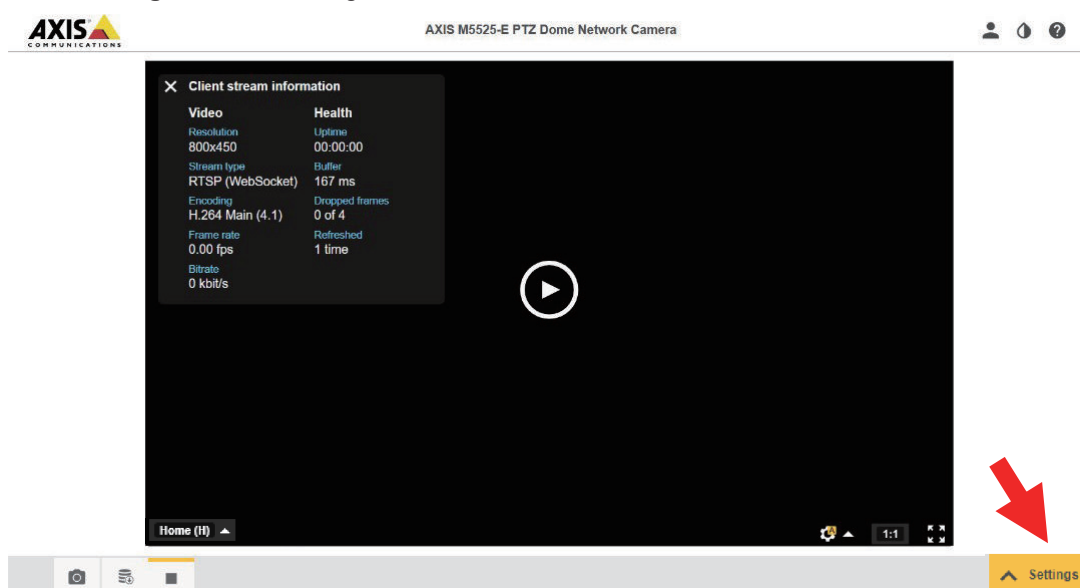
Configuring Recording Rules and Assigning Virtual Input

To record video files according to the state of the camera's virtual input, you need to create and configure the recording rule.

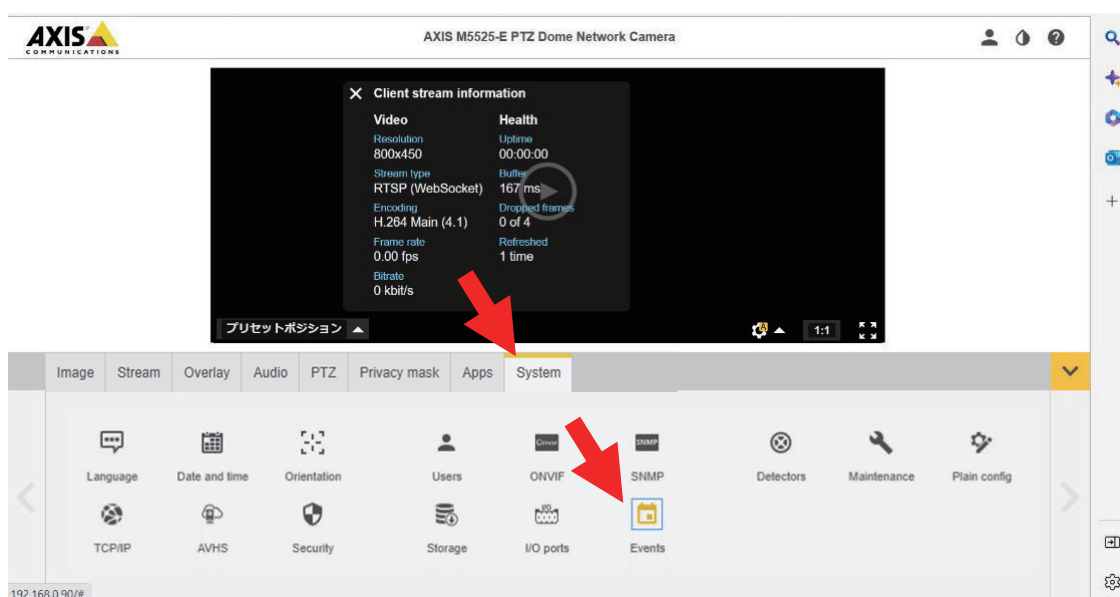
This section describes the procedure for setting up the camera according to the trigger method of the automation playback function.

Trigger method	Settings	Behavior
Pre/Post trigger method	This method records video for the total period (d) before and after the camera's virtual input ON (a) and the periods are specified in the camera's settings <b>Pre-trigger time</b> (b) and <b>Post-trigger time</b> (c).	
Start/Save trigger method	This method records video for the period (c), which starts when the camera's virtual input turns ON (a) and ends when the input turns OFF (b).	

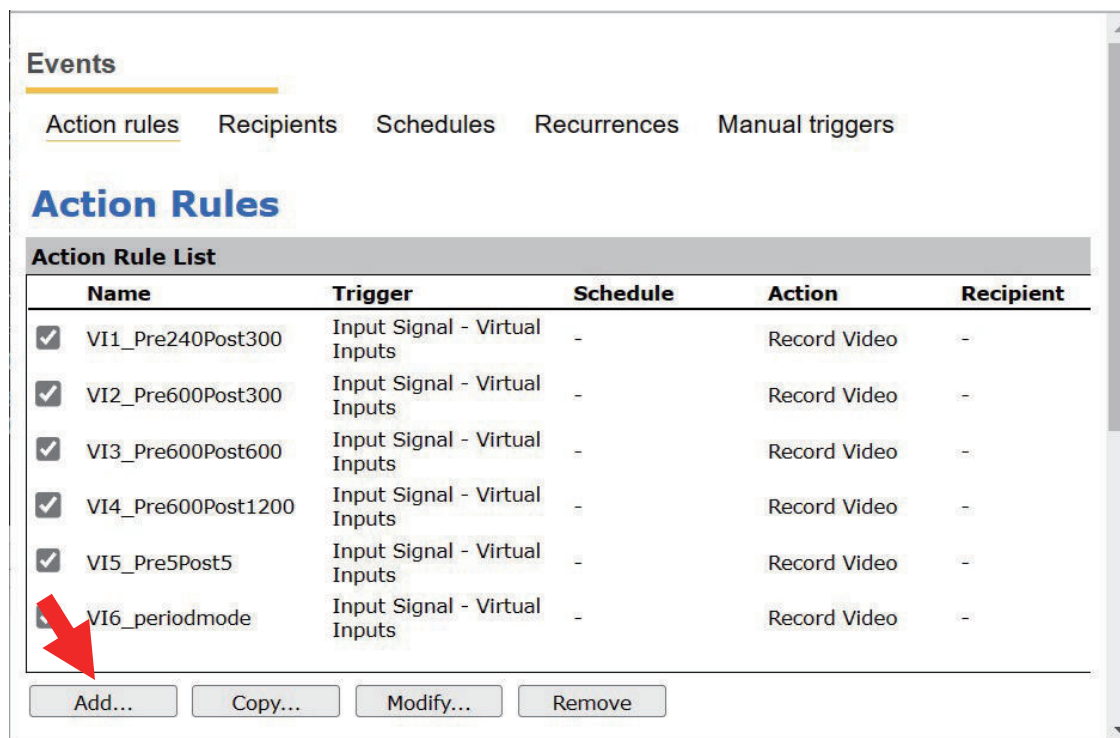
- 1 Click **Settings** in the lower right corner of the Live View window.



- 2 Click the **Events** icon on the **System** tab page.



- 3 Click the **Add...** button to add the rule.



- 4** Configure the recording rule of the camera according to the trigger method of automation playback.

- **In case of Pre/Post trigger method**

This example shows the settings when the **pre-trigger sampling time** is set to 20 seconds and **post-trigger sampling time** is set to 10 seconds in the Controller.

**Action Rule Setup**

**General**

☒ Enable rule

Name:

**Condition**

Trigger:  ☒ Start condition only

Active: ☒ Yes ☐ No

Schedule:

Additional conditions

Wait at least  before re-running the rule (max 23:59:59)

**Actions**

Type:

Stream profile:

Duration:

☒ Pre-trigger time  second(s)

☐ While the rule is active

☒ Post-trigger time  second(s)

Storage:

- In case of Start/Save trigger method

This example shows the settings when the **Sampling time** 10 seconds is set to the Controller.

**Action Rule Setup**

**General**

☒ Enable rule

Name: Start&RecordTrigger

**Condition**

Trigger: Input Signal (Select Input Signal.)

Virtual Inputs: 2 (Select Virtual Inputs.)

Active: ☒ Yes ☐ No

Schedule: Always (No Schedule) (Input the Virtual input port No. specified in the sample program.)

Additional conditions

Add...

Wait at least 00:00:00 before re-running the rule (max 23:59:59)

**Actions**

Type: Record Video (Select Record Video.)

Stream profile: ContinousTrigger (Profiles created in setting of Stream profile are listed. Select a related profile.)

Duration:

- ☐ Pre-trigger time 20 second(s)
- ☒ While the rule is active
- ☐ Post-trigger time 10 second(s)

Storage: Network Share

OK Cancel



### Precautions for Correct Use

Specify the network storage as the camera's video file output destination. If a video file is output to the camera's SD card, the video file cannot be played on Sysmac Studio.

## A2-1-5 Restarting the Camera and Checking the Settings

Make sure that the settings set to the camera are saved correctly even after the camera is restarted.

- Clock time and time zone settings
- Setting of storage of video files
- Setting of stream profiles and recording rules

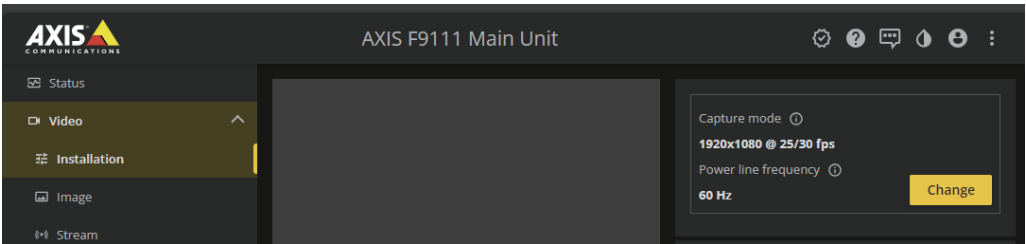


# A2-2 Example of Video Recording Settings with a High Frame Rate

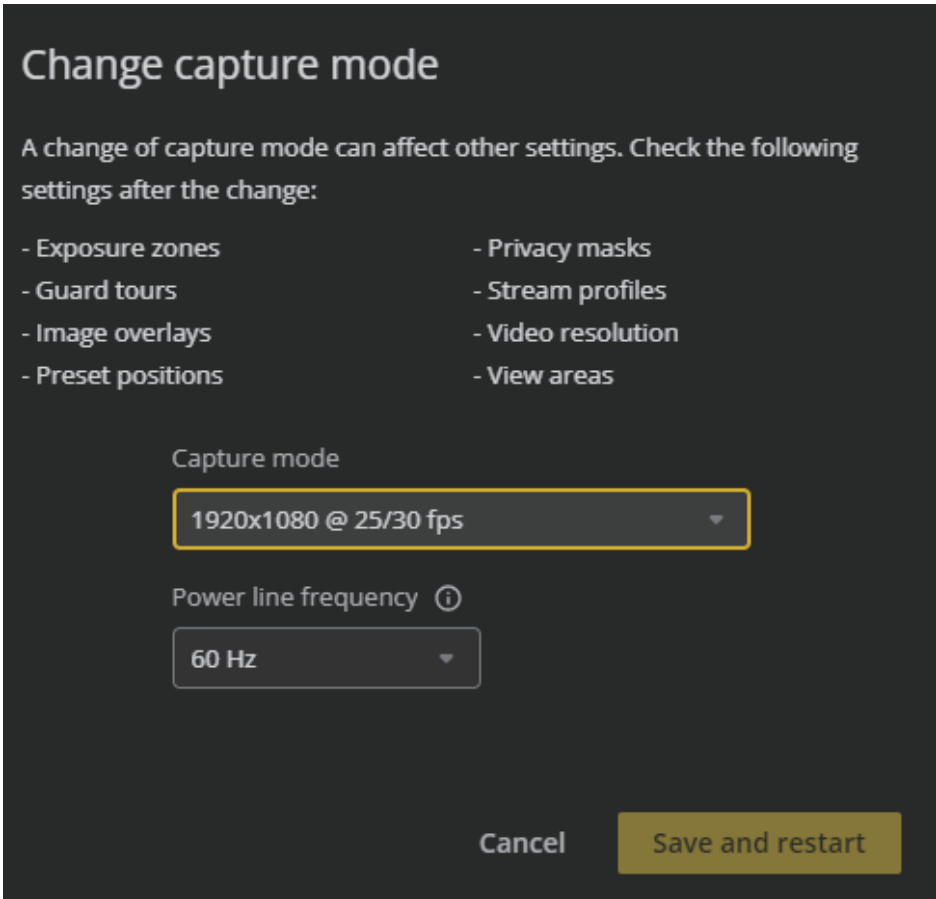
For some camera models, in order to shoot at the frame rate supported by the camera, you need to change the settings from the default.

In this section, an AXIS F9111 is used and the frame rate setting is changed from the default of 25/30 fps to 175/180 fps.

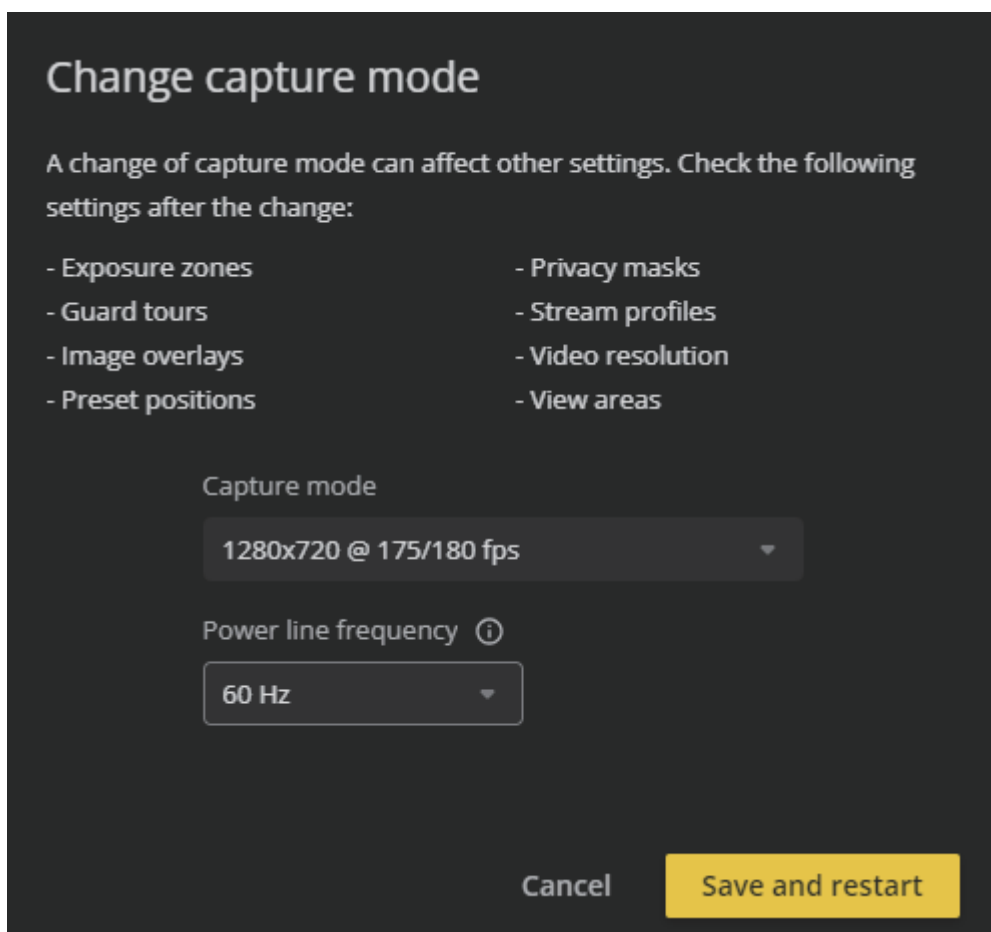
- 1
- Select **Video – Installation** menus.  
The current settings are displayed in the **Capture mode** window.



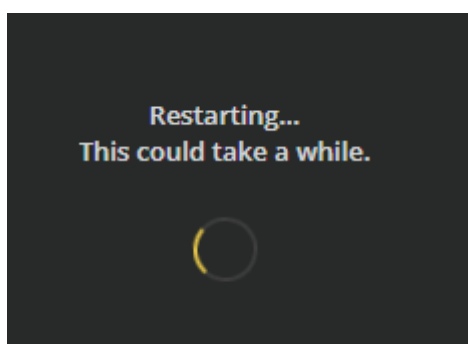
- 2
- Click the **Change** button.  
The **Change capture mode** window is displayed.



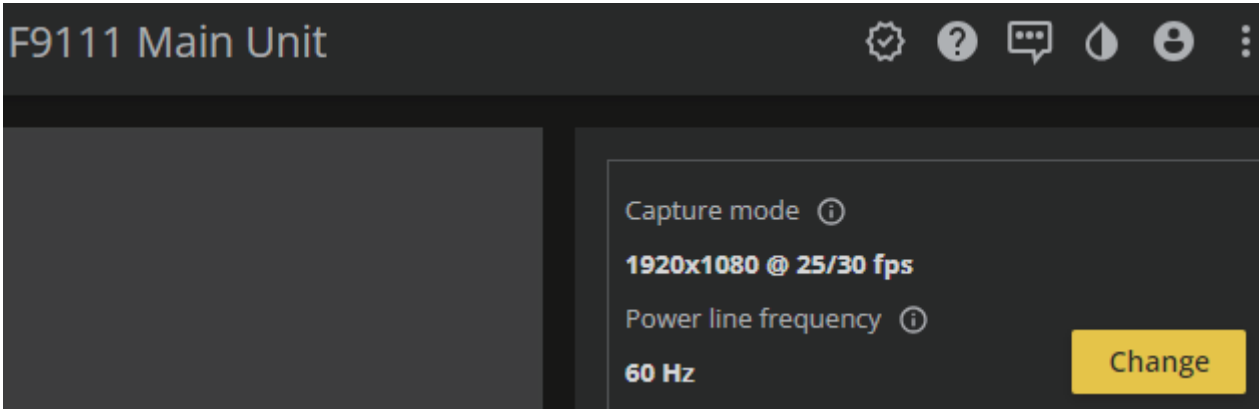
- 3** From the **Capture mode** pull-down menu, select the setting you want to apply.



- 4** Click the **Save and restart** button.  
Wait for the setting change to complete. It may take some time.



The capture mode is changed. You can create a stream profile for the settings that you have changed.



A2-2 Example of Video Recording Settings with a High Frame Rate

A2

## A2-3 Examples of Computer Settings

### A2-3-1 Example of Setting to Use a Computer as Network Storage

This section describes the steps to set up a computer as a network storage for the camera's video output destination. This is an example when the computer OS is "Windows 11 Pro version 22H2".



#### Precautions for Correct Use

Specify the network storage as the camera's video file output destination. If a video file is output to the camera's SD card, the video file cannot be played on Sysmac Studio.



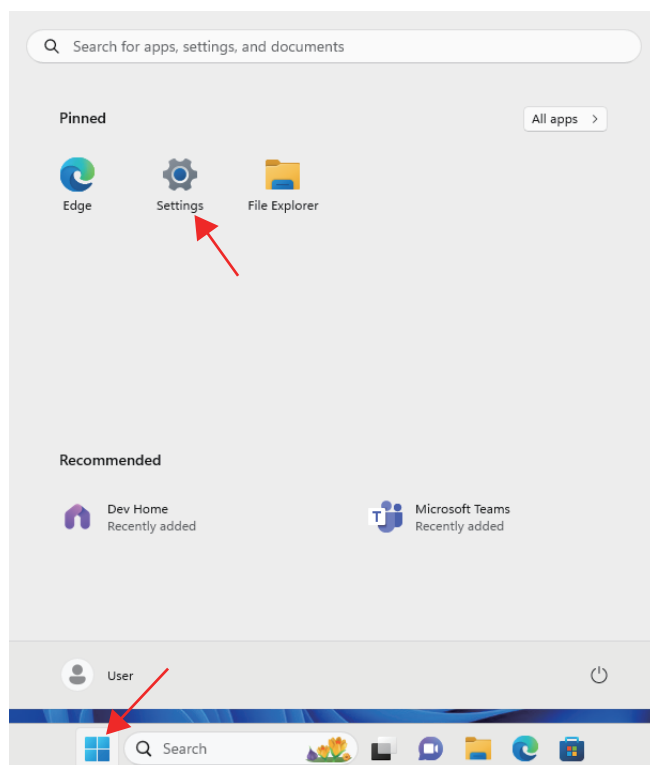
#### Additional Information

The below table describes an example of setting up a computer as a network storage.

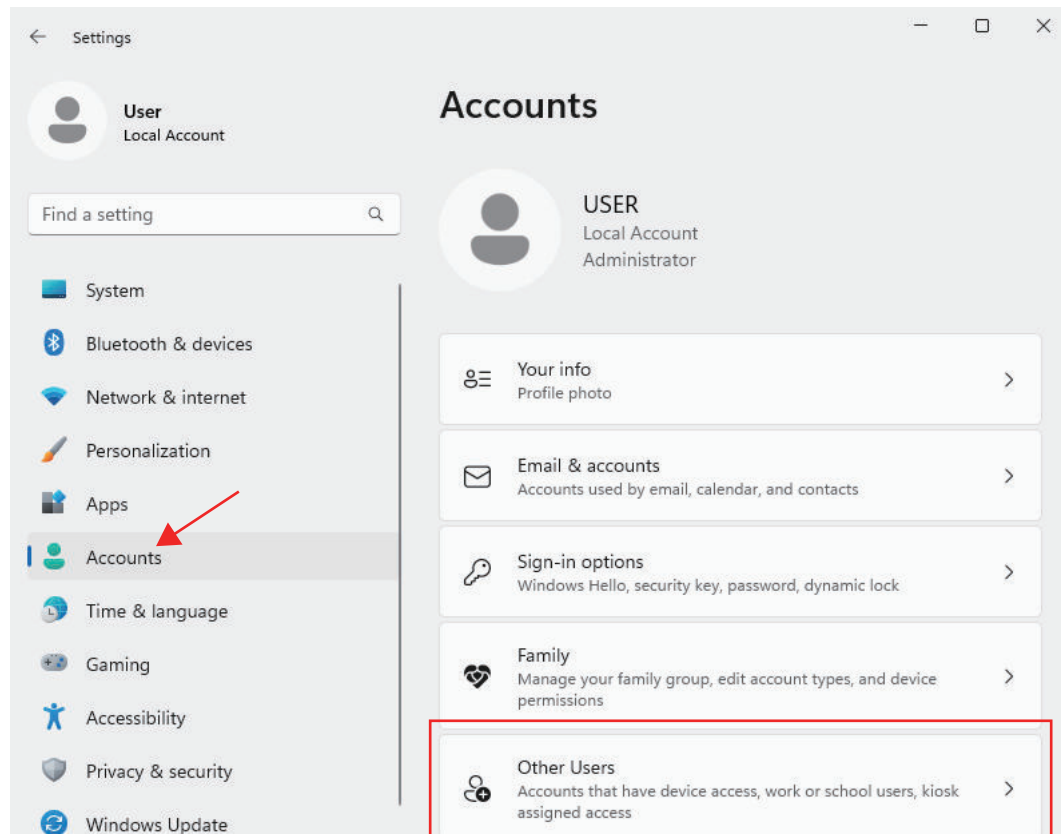
Item	Setting
The storage folder name of video files	apb_tmp
User	APB
Password	password

- 1 Create a local account to be used for authentication when accessing network storage from the camera.

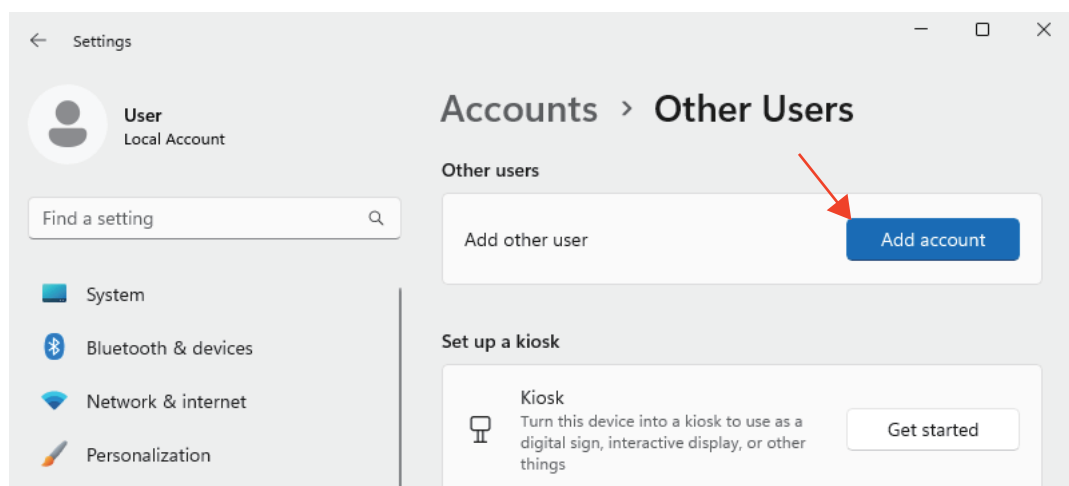
1) From the Windows Start menu, click **Settings**.



2) Click **Accounts**, then click **Other Users**.

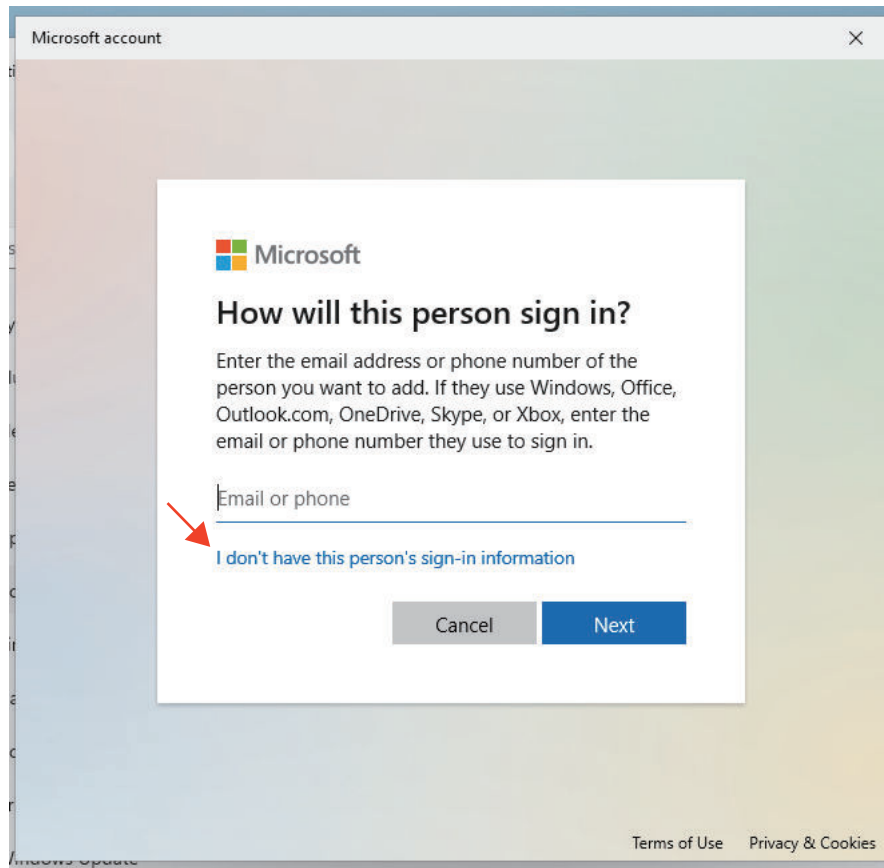


- 3) Click the **Add account** button in **Add other user** field.

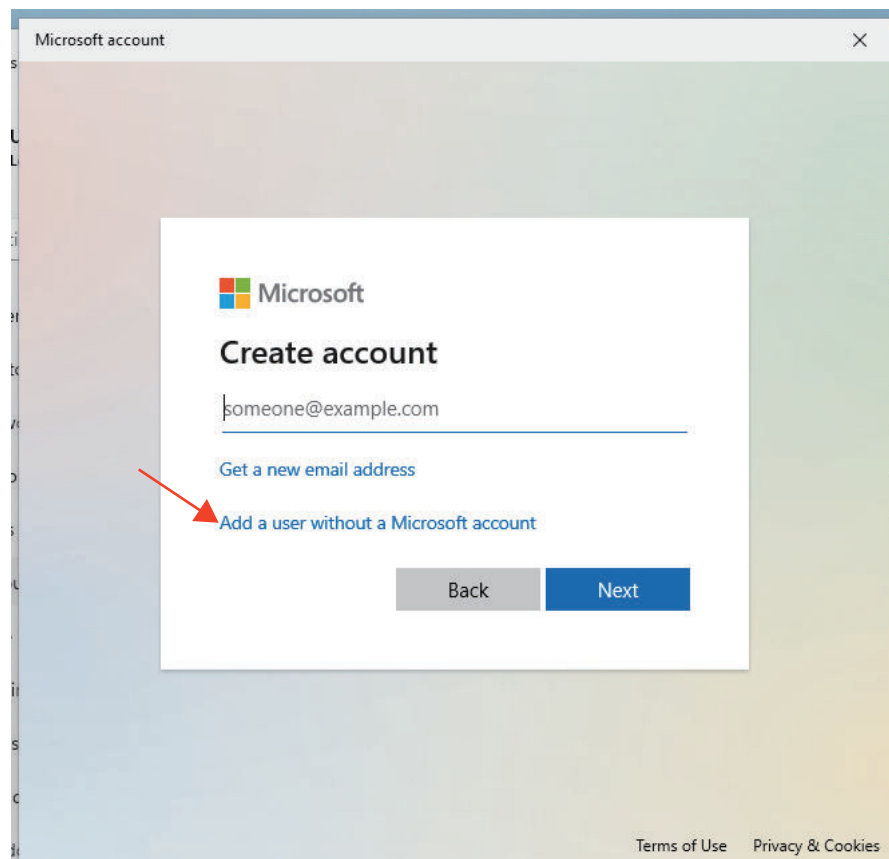


- 4) Click on **I don't have this person's sign-in information**.

The Microsoft account setting window will be displayed, but you don't create a Microsoft account here.

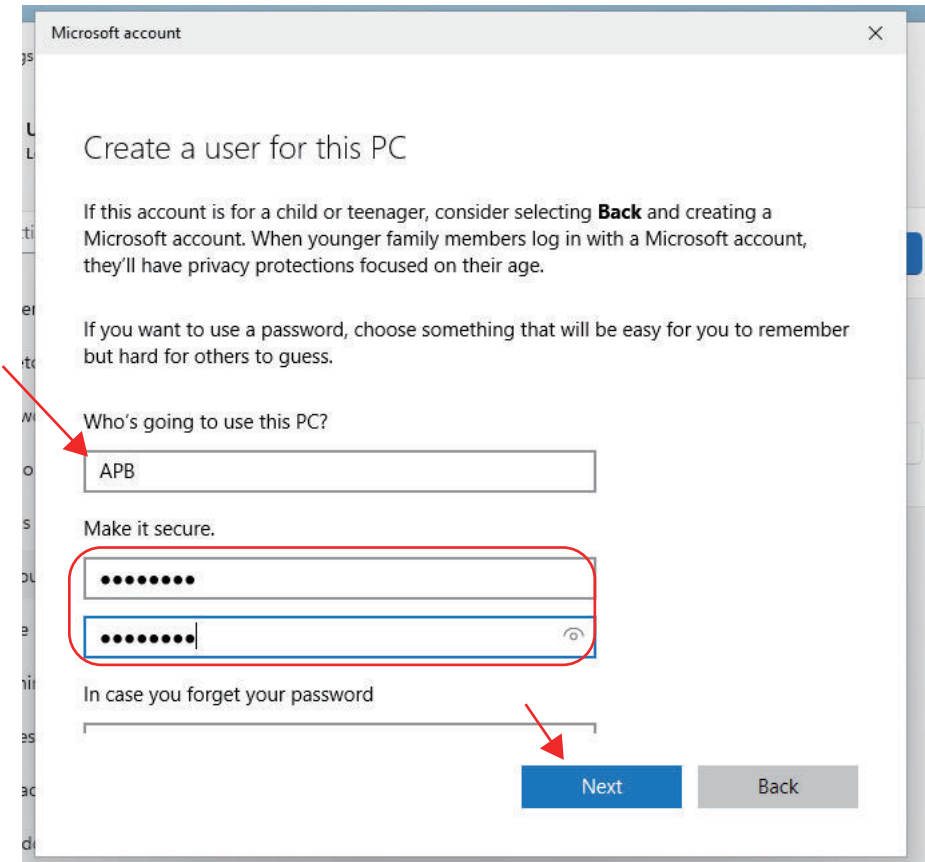


5) Click on **Add a user without a Microsoft account**.

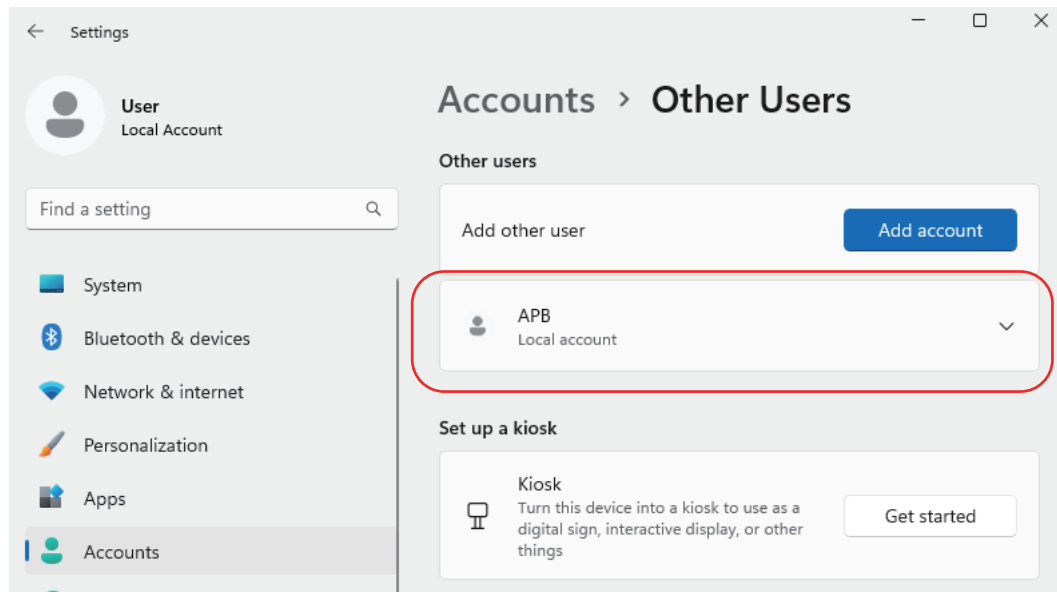


- 6) Enter the information for the local account you want to create and click the **Next** button.  
Enter the following for each.

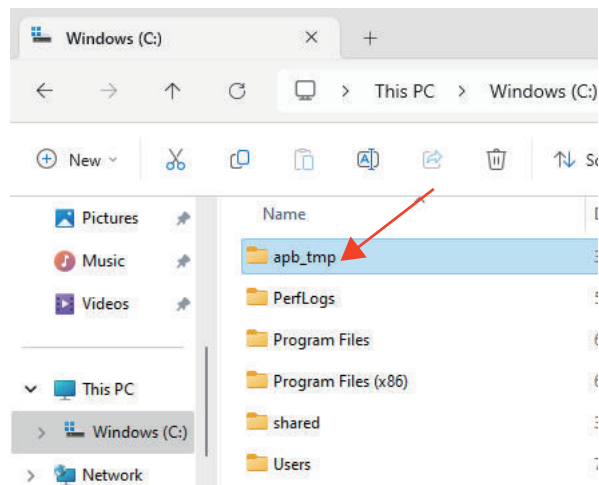
Item	Setting example	Description
Who's going to use this PC?	APB	Enter the user name used for authentication when accessing to network storage from the camera.
Make it secure.	Password	Enter the password used for authentication when accessing to network storage from the camera. Enter the same password in both fields.
In case you forget your password	(Select the item and enter the appropriate value.)	For Windows 11 Pro version 22H2, you should enter all 3 items, <b>Security question 1</b> to <b>Security question 3</b> .



User "APB" has been created.

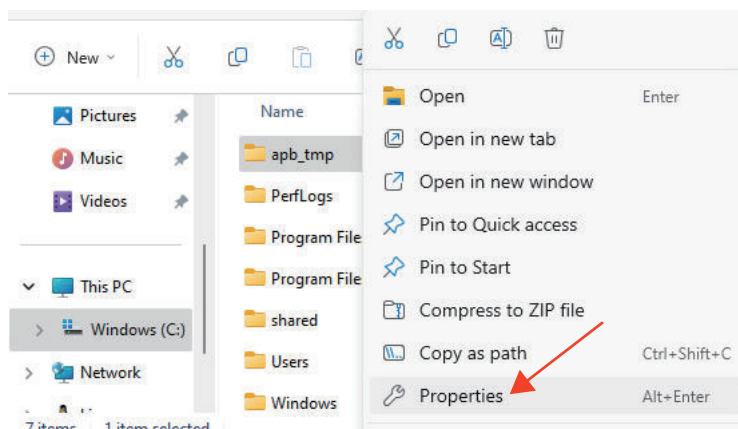


- 2** Create the shared folder to output video files from the camera.
- 1) Create a folder on your computer that you want to make a shared folder.  
In this example, create "apb\_tmp" in "C:\".

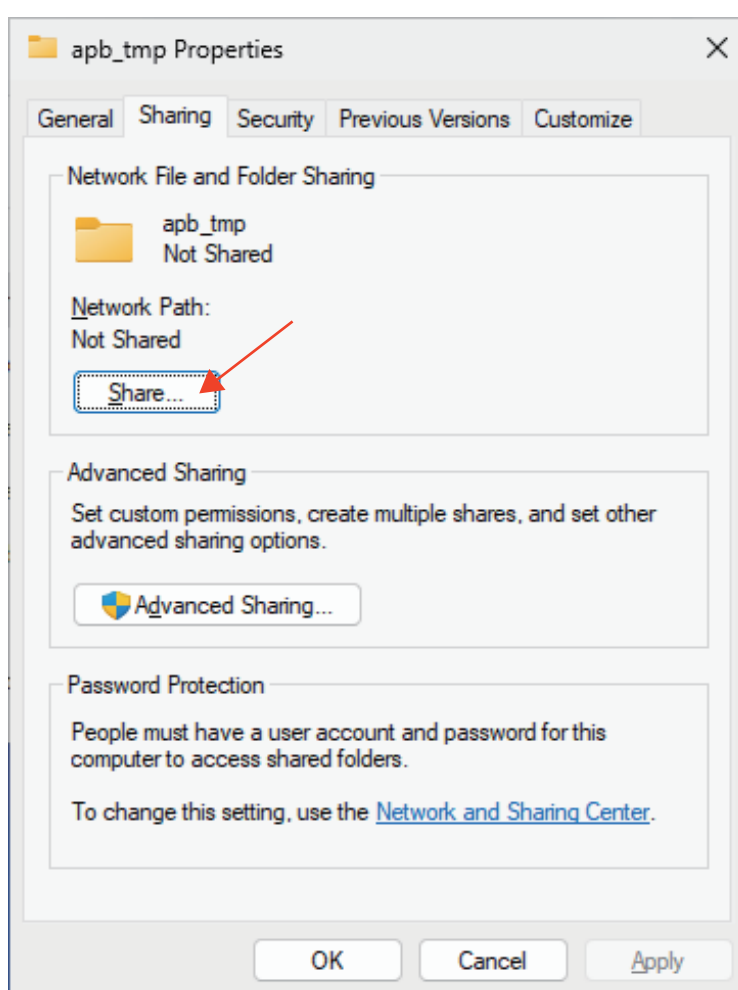


- 2) Right-click the folder to make a shared folder.  
Select **Properties**.

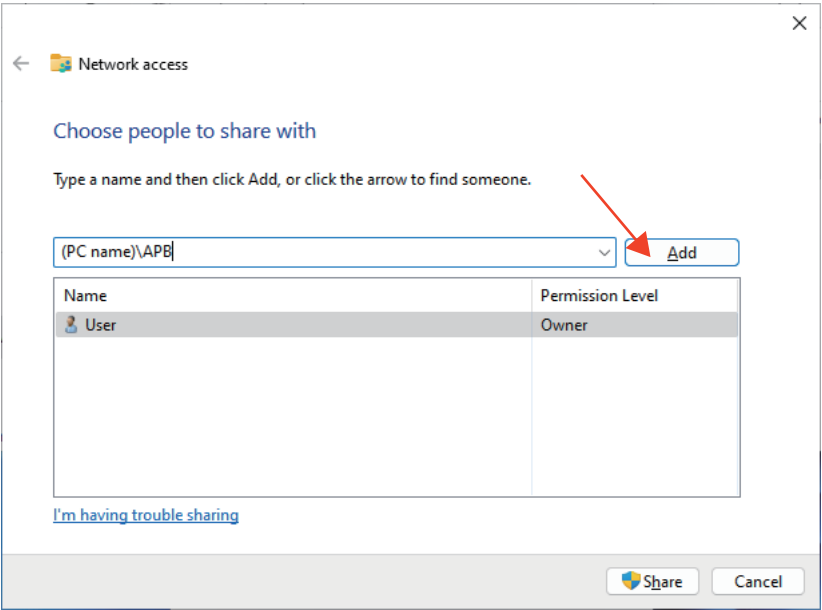




- 3) Click the **Share** button under **Network File and Folder Sharing**.



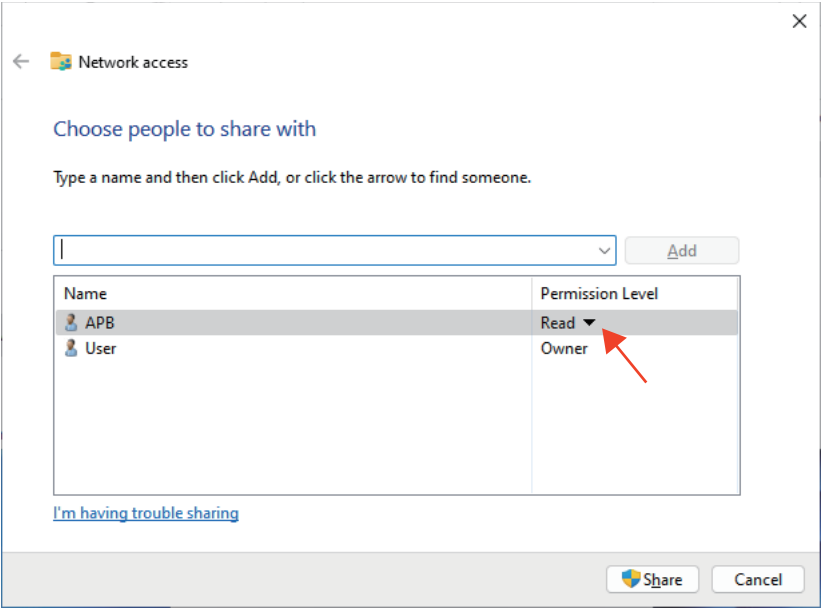
- 4) Specify the user who can access the shared folder.  
 In this example, you will enable the user "APB" created in the previous step to access the shared folder. In the (PC name) part in the figure below, enter the name or IP address of the computer and click the **Add** button.



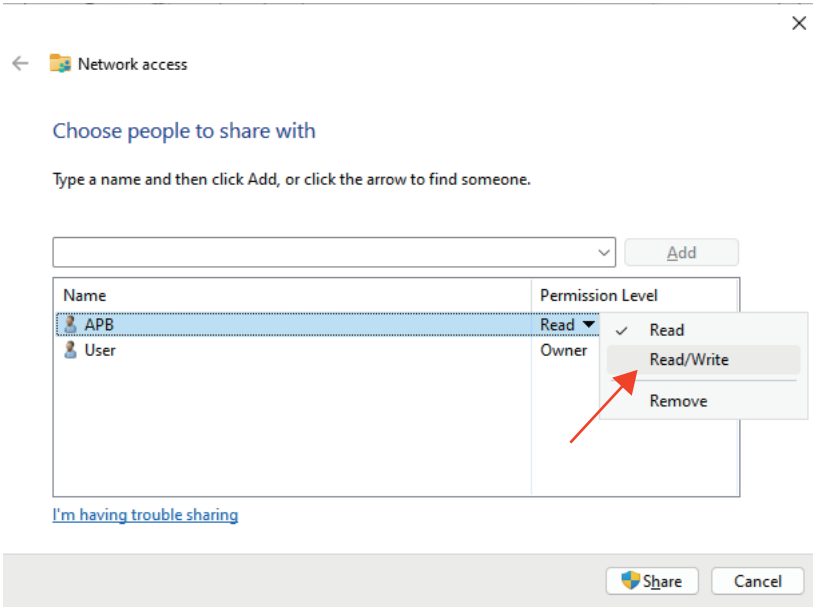
Input examples are shown in the below table.

Item	Computer settings	Example
Computer's name	demo_pc	demo_pc\APB
Computer's IP address	192.168.250.10	192.168.250.10\APB

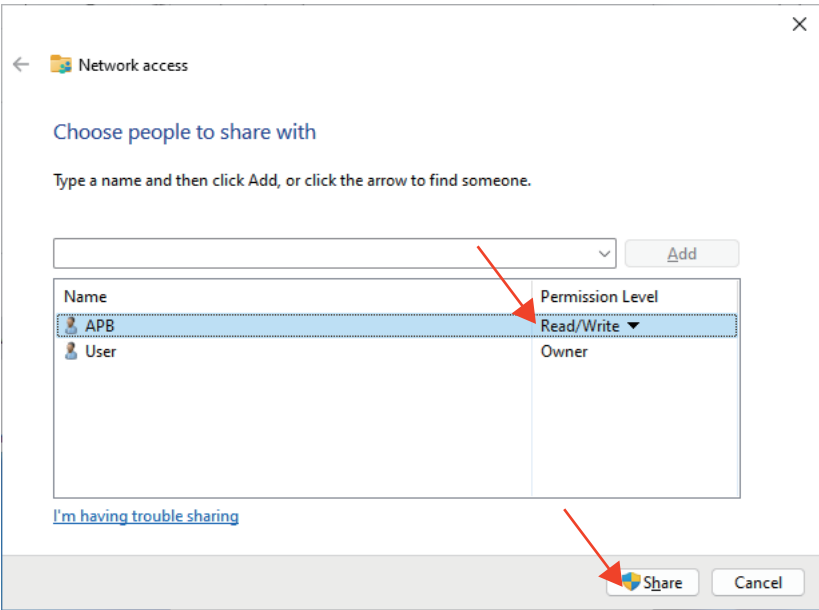
- 5) Enable writing to the shared folder so camera can output video files.  
Change the permission level of the user you added in the previous step. Click **Read**.



- 6) Change the permission level to **Read/Write**.



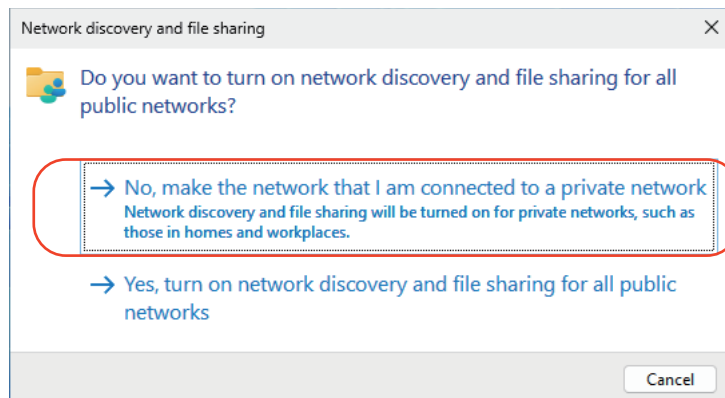
- 7) Activate the modified permission level.  
Make sure the **Permission Level** for the user **APB** is **Read/Write** and click the **Share** button.



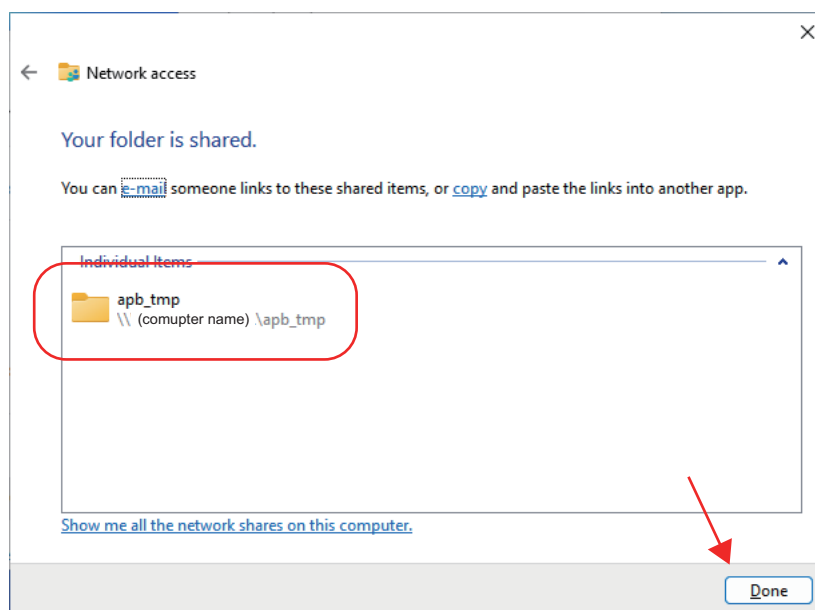


### Additional Information

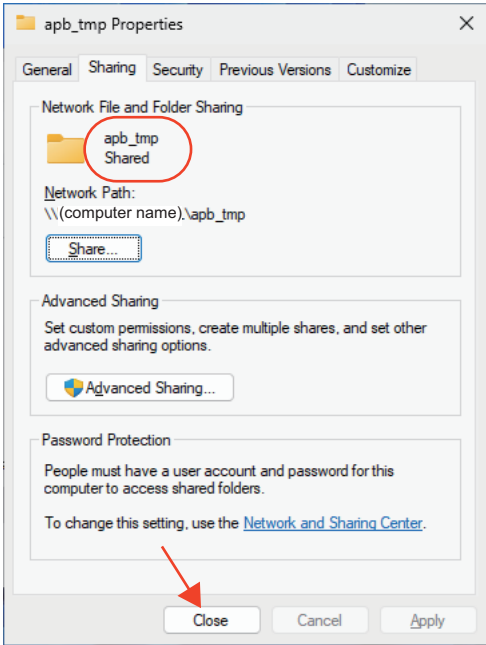
Depending on the network adapter settings, a window like shown below may appear. In this example, assuming that the network connecting the camera and computer is a closed network, select the **No, make the network that I am connected to a private network** option.



- 8) A shared folder "apb\_tmp" is created. Check the content and then click the **Done** button. In the (computer name) part of the example below, the name of the computer is entered.



The folder has been shared. Click the **Close** button.

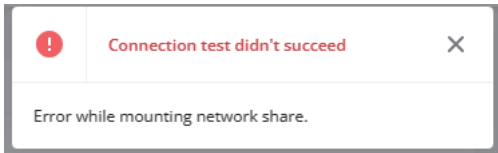


- 3** Specify the shared folder as the output destination for video files from the camera. Follow the steps in *3-4 Setting the Storage of Video Files* on page 3-11 to set up your camera.



**Precautions for Correct Use**

When mounting network storage (in this example, a computer) from the camera, an error like the shown below may occur depending on the computer's network settings.



In this case, the cause may be the settings of your computer's firewall or antivirus software, so try temporarily disabling them and see if the error persists. If the error is resolved, consult with your network and security administrator to take these appropriate measures.



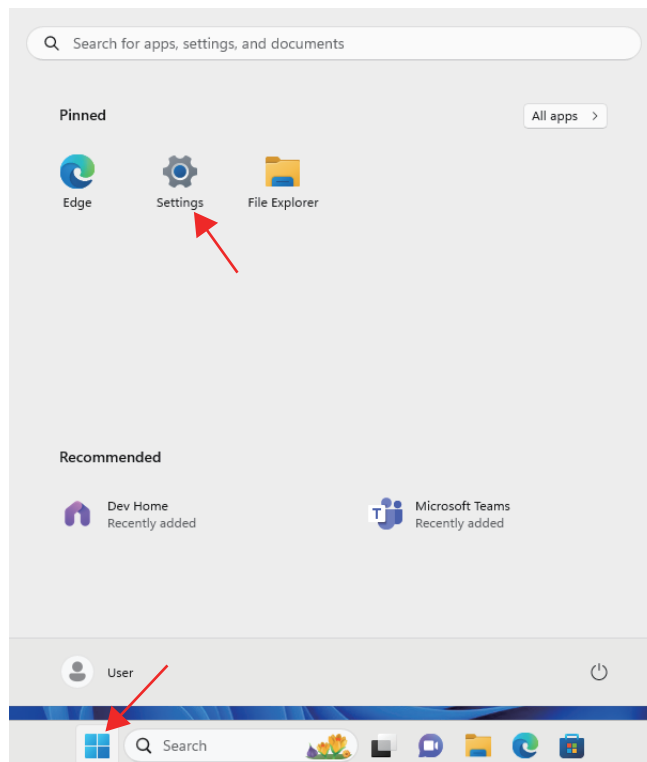
**Additional Information**

Axis cameras use the SMB protocol to connect to network storage.

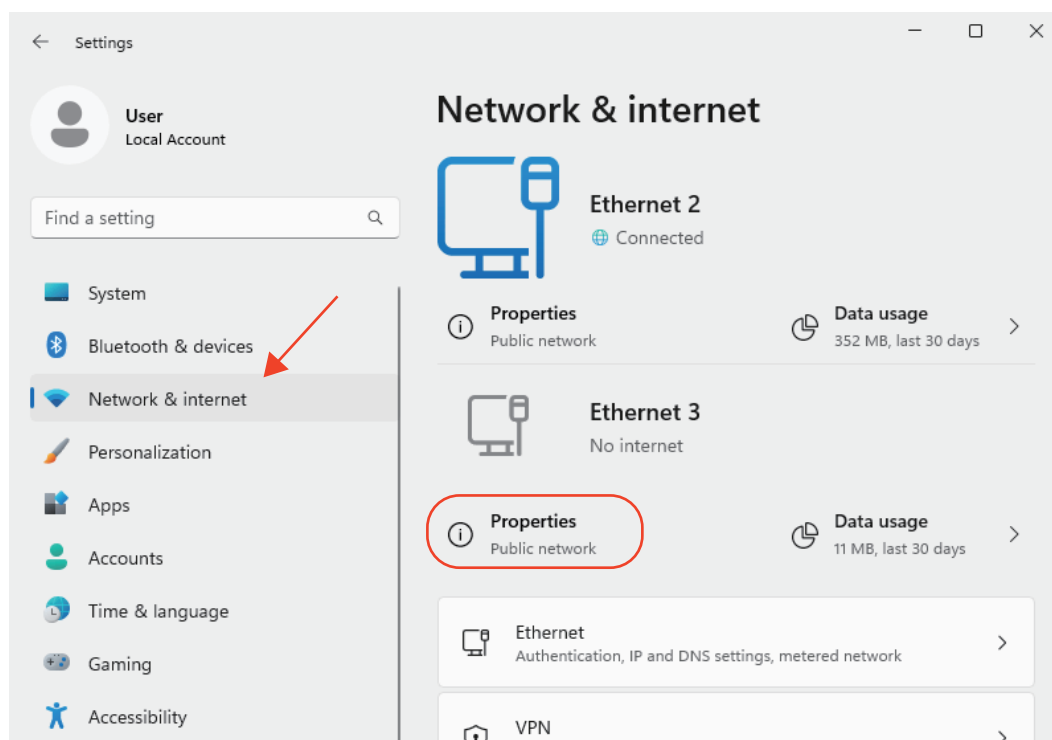
**A2-3-2 Example of Changing IP Address of a Computer**

This section describes the procedure of changing the IP address of a computer. This is an example when the computer OS is "Windows 11 Pro version 22H2".

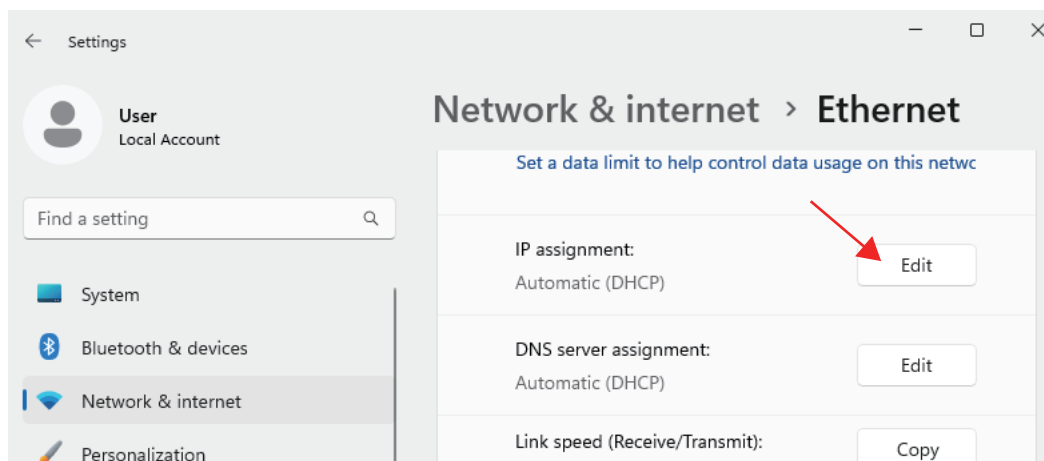
- 1** From the Windows Start menu, click **Settings**.



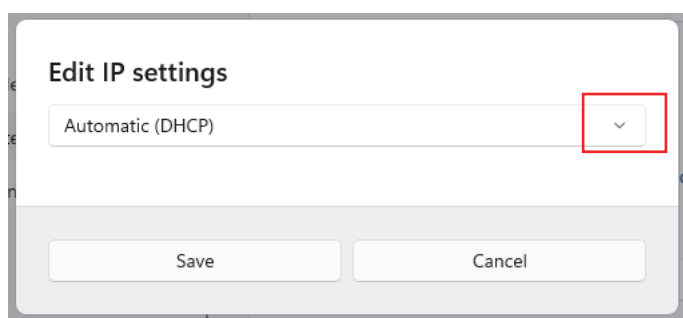
- 2 Click on **Network and internet**, and then click on the **Properties** of the network interface to be used to connect to the camera.  
In this example, a network interface named "Ethernet 3" is used to connect to a camera.



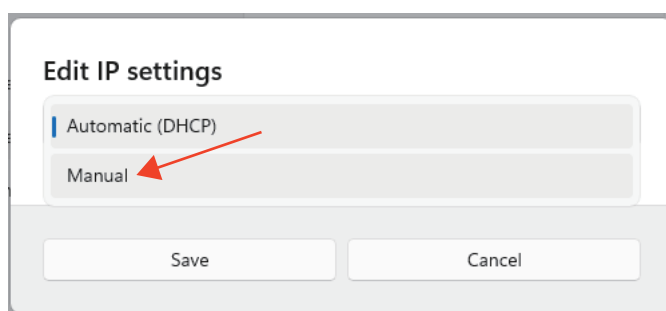
- 3 Click the **Edit** button for **IP assignment**.



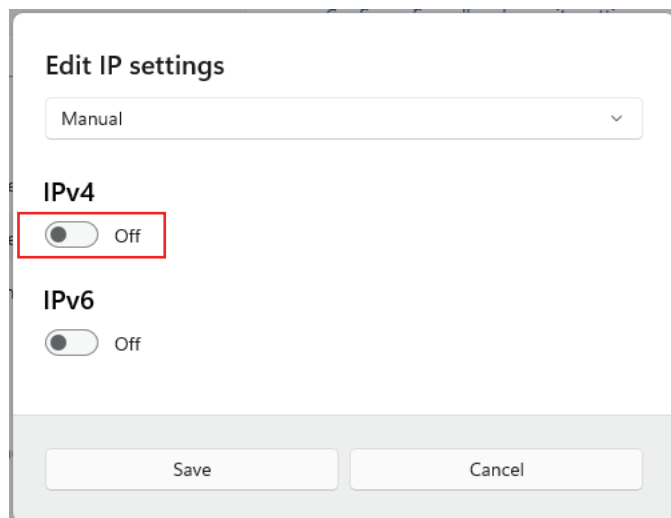
- 4** Click the **v** mark on the **Edit IP settings** window.



- 5** Select **Manual**.



- 6** If **IPv4** is **OFF**, click the slider to turn it **ON**.



**Edit IP settings**

Manual

**IPv4**

☐ Off

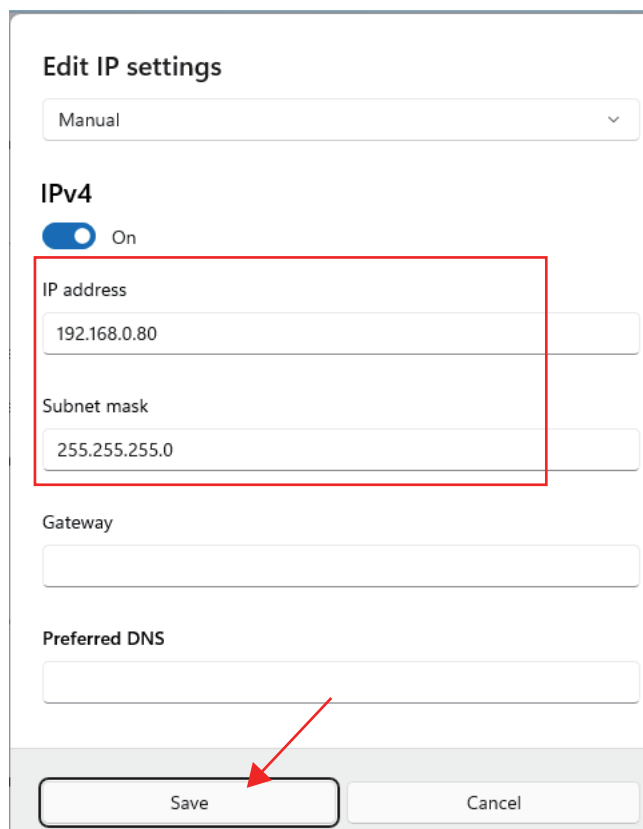
**IPv6**

☐ Off

Save Cancel

Fields for setting the IP address etc, are displayed.

- 7** Enter the **IP address** and **Subnet mask**, then click the **Save** button. Configure the Gateway, DNS, and other settings according to your network configuration. If they are not going to be used, leave them blank.



**Edit IP settings**

Manual

**IPv4**

☒ On

IP address

192.168.0.80

Subnet mask

255.255.255.0

Gateway

Preferred DNS

Save Cancel

Now you can change your computer's IP address.



# A3

## Communications between the Camera and Controller

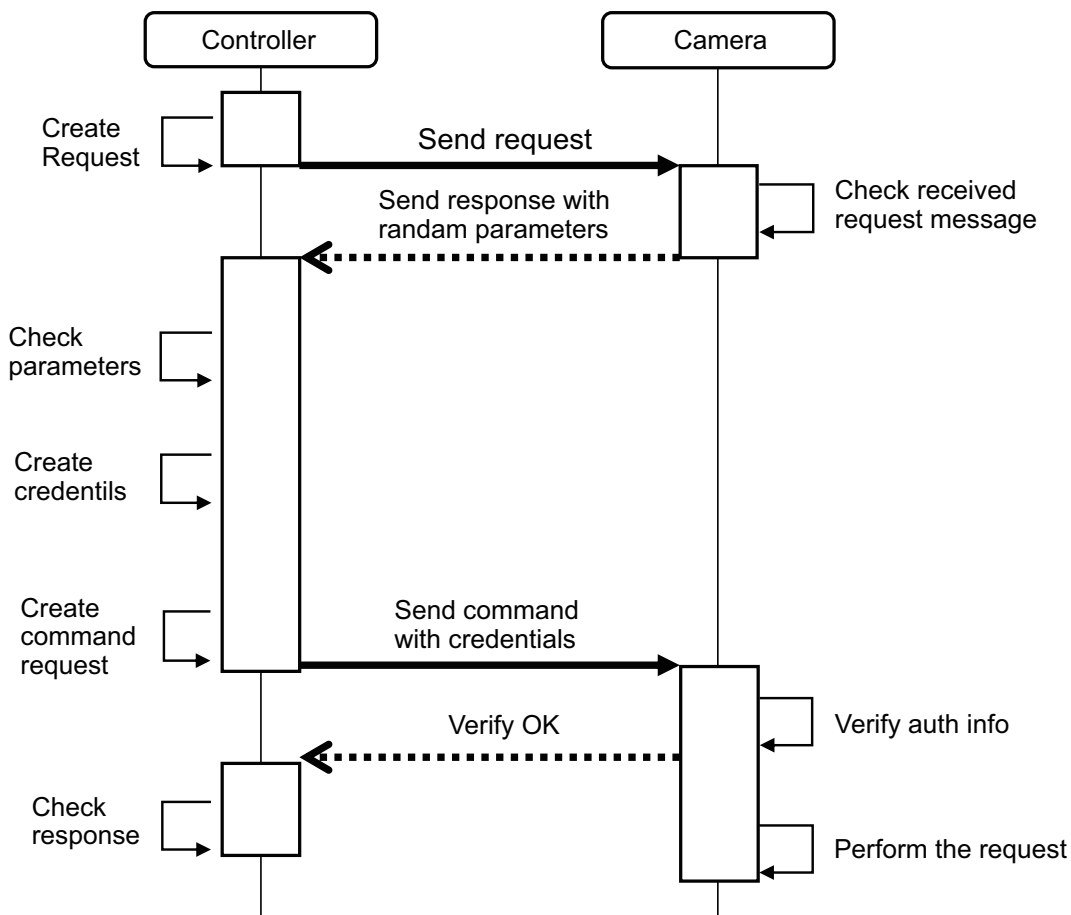
---

<b>A3-1</b>	<b>About Digest Authentication.....</b>	<b>A3-2</b>
<b>A3-2</b>	<b>List of VAPIX Commands Used in the Sample Program .....</b>	<b>A3-3</b>
A3-2-1	Sample Ver.2 .....	A3-3
A3-2-2	Sample Ver.2 .....	A3-3
<b>A3-3</b>	<b>Virtual Input .....</b>	<b>A3-4</b>

## A3-1 About Digest Authentication

This sample program performs Digest authentication and sends command to the camera to control the camera.

- 1** The Controller sends a request to the camera.
- 2** The camera responds with the information required for authentication.
- 3** The Controller receives the response and generates the camera's authentication information from the user name, password, and received information.
- 4** The Controller sends a request to the camera with authentication information.
- 5** The camera authenticates and executes the request. Then camera returns an OK response to the Controller.



## A3-2 List of VAPIX Commands Used in the Sample Program

The function block POUs included in this sample program use the following VAPIX commands to control the camera.

### A3-2-1 Sample Ver.2

Camera control	FB in sample programs	Used VAPIX command
Turn ON the virtual input of the camera	ExecCamRecording	virtualinput/activate.cgi
Turn OFF the virtual input port of the camera		virtualinput/deactivate.cgi
Read device information	SetCameraTimeFromController	basicdeviceinfo.cgi
Update clock time		date.cgi*1
		time.cgi*1

\*1. Selects automatically according to the basicdeviceinfo.cgi outcome.

### A3-2-2 Sample Ver.2

Camera control	FB in sample programs	Used VAPIX command
Turn ON the virtual input of the camera	PrePostTriggerRecordingFB	virtualinput/activate.cgi
Turn OFF the virtual input port of the camera	TriggerdIntervalRecordingFB	virtualinput/deactivate.cgi
Update clock time	UpdateCameraTimeFB	date.cgi <sup>*1</sup>
	UpdateCameraTimeFB2	time.cgi <sup>*2</sup>

\*1. It may work with camera OS 10.x or earlier.

\*2. It may work with camera OS 10.x or later.

# A3-3 Virtual Input

The virtual input has an ON and OFF state for each virtual input port.

The operation of the camera when the virtual input is ON and OFF can be determined by the camera's event settings for each virtual input port. Refer to *3-5 Configuring Virtual Input* on page 3-15 for the settings.

Using this event settings of the camera, you can save videos for the **Pre/Post trigger** method and the **Start/Save trigger** method, as shown in the figure below.

Trigger method	Settings	Behavior
Pre/Post trigger method	This method records a video for the total period (d), which consists of <b>Prebuffer</b> time (b) and <b>Postbuffer</b> time (c), before and after the camera's virtual input ON (a).	
Start/Save trigger method	This method records video for the period (c), which starts when the camera's virtual input turns ON (a) and ends when the input turns OFF (b).	

# A4

A4

## Tips

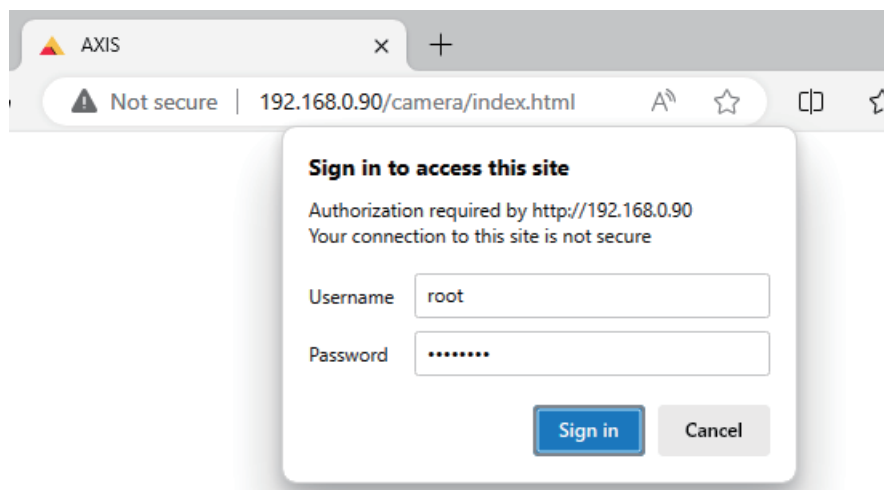
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A4-1	Check Items When Using Untested Cameras.....	A4-2
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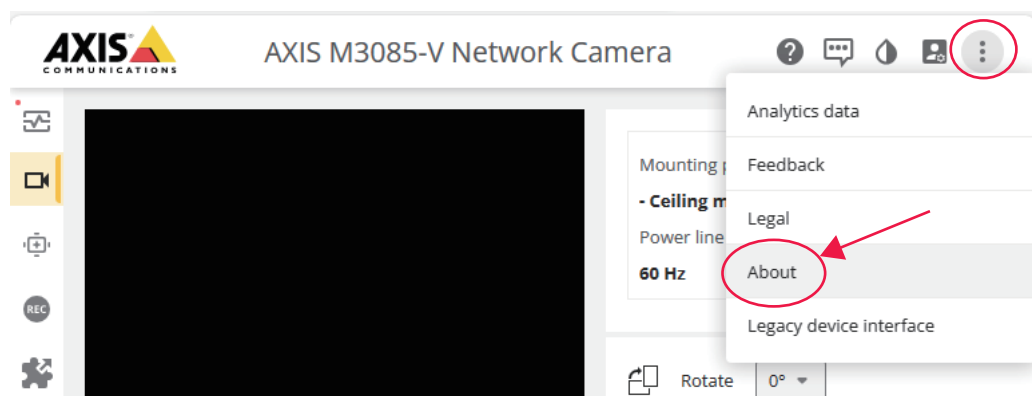
## A4-1 Check Items When Using Untested Cameras

When you use the sample programs with untested cameras not listed in *2-2 Confirmed with Sample Ver.2 Camera* on page 2-4 or *A1-2 Confirmed with Sample Ver.1 Camera* on page A1-4, perform the following checks.

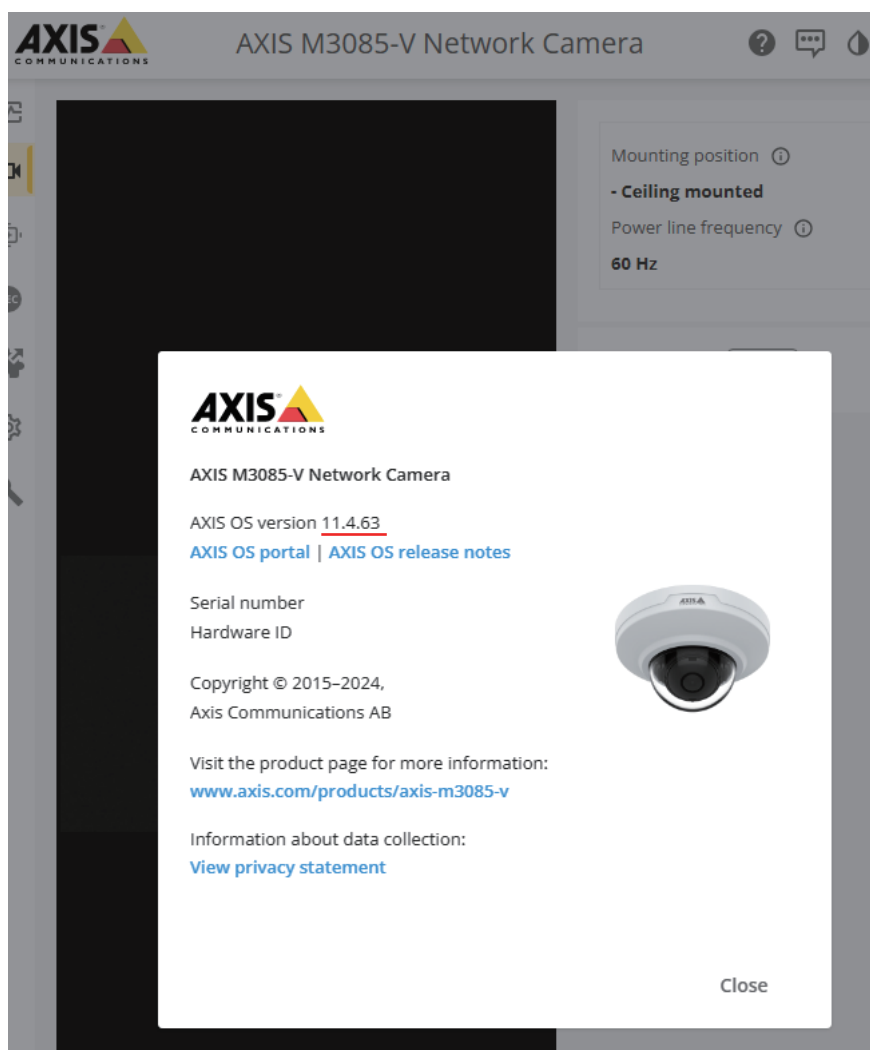
- 1** Check the camera's OS version.
  - 1) Connect the camera and computer, then enter `http://(camera's IP address)` in the address bar of the Web browser and access the address.  
If the camera's IP address is 192.168.0.90, enter `http://192.168.0.90` in the address bar and access the address.  
You will be redirected to the setting view of the camera, and then the authentication window is displayed.
  - 2) Enter the user authentication information set on the camera.



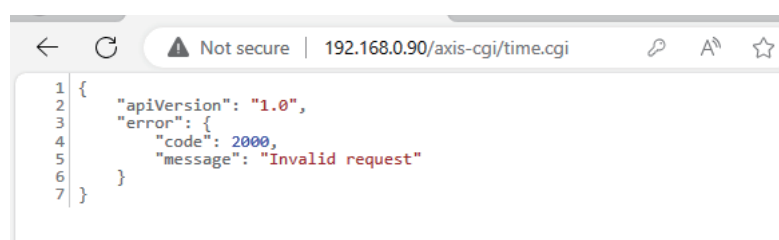
- 3) Click the three dots menu on the right side of the camera settings window, and then select **About**.



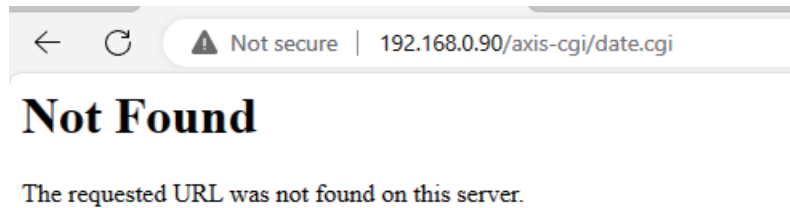
The information of the camera is displayed. In this example, the OS version is 11.4.63.



- 2** Check whether VAPIX command for clock time setting is accepted.
- The VAPIX commands accepted differ depending on the camera's OS version. Refer to *A3-2 List of VAPIX Commands Used in the Sample Program* on page A3-3 for the supported VAPIX command.
- 1) Enter `http://(camera IP address)/axis-cgi/` (corresponding VAPIX command for clock time setting) in the address bar of your computer's web browser and access the address.  
If the camera's OS version is 11.4.63 and the IP address is 192.168.0.90, enter `http://192.168.0.90/axis-cgi/time.cgi` in the address bar and access the address.  
If a response like the one below appears, the VAPIX command you entered may be accepted.  
In the example shown in the image below, `time.cgi` might work.



If a response like the one below appears, the VAPIX command you entered may not be accepted. In the example shown in the image below, date.cgi is not accepted.



### 3 Check whether VAPIX command for controlling virtual input is accepted.

- 1) Type `http://(camera IP address)/axis-cgi/virtualinput/activate.cgi` in the address bar of the web browser and access the address.

If the camera's IP address is 192.168.0.90, enter `http://192.168.0.90/axis-cgi/virtualinput/activate.cgi` in the address bar and access the address.

If a response like the one below appears, the VAPIX command `virtualinput/activate.cgi` may be accepted.



- 2) Type `http://(camera IP address)/axis-cgi/virtualinput/deactivate.cgi` in the address bar of the web browser and access the address.

If the camera's IP address is 192.168.0.90, enter `http://192.168.0.90/axis-cgi/virtualinput/deactivate.cgi` in the address bar and access the address.

If a response like the one below appears, the VAPIX command `virtualinput/deactivate.cgi` may be accepted.





#### 4 Check the behavior of the sample program.

If the VAPIX commands in step 2 and step3 are both accepted, the sample program is likely to work correctly. So, use the sample programs and see if they work as intended.





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