OMRON

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

Special Information

Special information in this manual is classified as follows:



Precautions for Safe Use

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



Precautions for Correct Use

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



Additional Information

Additional information to read as required. This information is provided to increase understanding and make operation easier.



Version Information

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

- Controllers
- Sysmac Studio
- Axis cameras

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Related Documents

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 Buf- falo NAS
W632	Playback data Collection system Environment construction procedures for Synology NAS
W639	NX-series CPU Unit Automation Playback 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.



Revision code	Date	Revised content			Revised content		
01	July 2023	Original production					
02	May 2024	Added camera models that have been confirmed to work.Reviewed the manual configuration and added and modified the content.Corrected mistakes.					

About Sample Programs

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Overview of Sample Programs -1

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 Program List

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

Programming
V 📋 POUs
▼ 🛱 Programs
🔻 🖂 UpdateCameraTime
L 콜· UpdateCameraTime
🔻 🔤 UpdateCameraTime2
∟ 클· UpdateCameraTIme2
🔻 💀 PrePostTriggerRecording
L 클· PrePostTriggerRecording
🔻 🔤 TriggeredIntervalRecording
L 🚭 TriggeredIntervalRecording
▼ 😹 Functions
L 🗐 GetDigestParam
L 🗐 CreateDigestRequest
L 🖻 CreateDigestRequestPOST
L 🗐 GetTimeStr
L 🗐 GetUTCTimelSO8601
▼ 😹 Function Blocks
L 🗾 UpdateCameraTimeFB
L 🗐 UpdateCameraTimeFB2
∟ 💀 PrePostTriggerRecordingFB
L 🔤 TriggeredIntervalRecordingFB
L 🗐 Cameralnput

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

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

- Cameras
- Network storage

1-2-1 Program POUs

You can assign these POUs 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 Pre/Post trigger method.		
TriggeredIntervalRecord- ing	This program records the video for the Start/Save trigger method.		

1-2-2 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
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.

1-2-3 Function Block POUs

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

POU name	Description
UpdateCameraTimeFB	This function block sets the clock time information of the Controller to the cam-
	era.
UpdateCameraTimeFB2	This function block sets the clock time information of the Controller to the cam-
	era.
PrePostTriggerRecordingFB	This function block records the video for the Pre/Post trigger method of auto-
	mation playback.
TriggeredIntervalRecordingFB	This function block records video for the Start/Save trigger method of automa-
	tion playback.
CameraInput	This function block turns ON or OFF the virtual input of the camera.

2

System Configuration and Usage Procedures

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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	NX502-1[]00 (Unit	version 1.	.63)		192.168.250.30
		This document as	sumes tha	t the following autom	ation playback settings	
		have been set in t	he Control	ler.		
		Sampling Setting	j 1			
		ltem		Setting		
		Trigger method		Pre/Post trigger me	ethod	
		Pre-trigger samp	ling time	20 seconds		
		Post-trigger sam	pling time 10 seconds			
		Sampling Setting	J 2			
		Item	5	Setting		
		Trigger method	Start/Save	e trigger method		
		Sampling time	10 seconds			
(0)						
(3)	Ethernet	An Ethernet switch supporting PoE is used.				
	switch	Use one that can supply sufficient power to the camera. On some Ethernet				
		switches, some po	switches, some ports can supply power by PoE and some cannot.			

No	Device	Descript	IP address	
(4)	Network storage	A storage for saving video files. It is connected to the camera via SMB p This manual assumes that the following	192.168.250.10	
		Item	Setting	
		The storage folder name of video files	apb_tmp	
		User	APB	
		Password	password	
(5)	Cameras	Network cameras made by Axis.This manual assumes that the followingItemSettingUserrootPasswordpassword	settings have been set.	192.168.250.90
(6)	Network cables	Use Ethernet cables that can be used w		
(7)	PoE com- patible net- work cable	Prepare a PoE-compatible network cabl It can be used for both communications cable to the camera and a port of the Et er by PoE.		

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 A2-19 for the setting example.

2-1-1 Cameras that Omron Has Verified to Operate Correctly

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	Туре	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

Model	OS version	Туре	Maximum resolution	Maximum fps
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 ^{*1}	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, refer to *Specifications of Function Block POUs* on page A1-1, check the interfaces supported by the camera, and create your camera control programs.

2

2-2 Application Procedures

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

- 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 How to Use Sample Programs 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.
- 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.

Camera Settings

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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 AXIS F2115-R + AX- IS F9111	A2-2 Example of Video Recording Set- tings with a High Frame Rate on page A2-16

3-2 Initial Setting of Cameras

Use your computer's web browser to set up the camera. When staring 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 (192.168.0.90), which is the initial IP address of the camera to be connected. In this example, to set the computer's network address to 192.168.0.X, configure the settings 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".

1 🗊 그	Туре	to filter
Name	IP Address	Serial Number
AXIS M5525-E -	192.168.250.90	
AXIS M3085-V -	192.168.0.90	

• You can download "AXIS IP Utility" from www.axis.com.

		earch				Q	& @
	SOLUTIONS	PRODUCTS	LEARNING	SUPPORT	PARTNER	WHERE TO BUY	
AXIS IP Easy discovery of IP	Utility address	C					
OVERVIEW COMPATIBLE P	RODUCTS SUPPORT.	IND RESOURCES					FREE DOWNLOAD
	AXIS IP Utility hel network are auto mask and Defau user interface is The Axis device	ps you set the IP matically discove t router) or config available in Englis and the client co	address of an A ered and display gure the device sh, French, Gern omputer must	xis network vic ed. Assign net to obtain its IP nan, Italian, Jap be on the sam	eo product. Ax vork parameter address from <u>E</u> anese and Spar te subnet/netv	is devices on the rs (IP Address, Subnet DHCP, AXIS IP Utility's nish. work segment.	
	HOW TO FIND THE	SERIAL NUMBER	Free do	ownloa	ad		
AXIS IP Utility							
Version 5.0 LATEST						RELEASE NOTES	DOWNLOAD
AXIS IP Utility Version 4.18.0 INTEGRITY CHECKSUM						RELEASE NOTES	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 A2-28.
- **2** Enter the IP address of the camera in the browser. In this example, enter 192.168.0.90.

	In New tab	×	+
С	▲ 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.

		0 🛱 🛈	
	AXIS M3085-V Network Camera		
	Usemame		
	root		
	Set a password for the root account		
*	Type password 1 - 64 characters		
	Repeat password		
	Type password		
	0		
	I accept the end user license agreement.		AXISA
	Share non-personal browser data to help us improve your user experience. This will download and run Google Analytics. Learn more.		
	Add user		
			\smile
			AXIS OS version: 11.4.63 Serial number: B8A44F540991

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.

192.168.0.90/ca	mera/index.html	Aø	☆	Cþ
Sign in to	access this site			
Authorizatio Your connec	n required by http://192 tion to this site is not se	2.168.0.90 ecure)	l
Username	root			
Password	•••••			
	Sign i	n	Cancel	

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 A2-16 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.
 - 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

	AXIS M308	5-V Network Camera	\odot	?	 ٥	0	:
Status	1						
D Video	~	IPv4					
Recordings		Assign IPv4 automatically					
🗱 Apps		IP address					
រទិះ System	^	192.168.250.90					
Time and location	(Subnet mask					
S Network	1	Router					
Security		192.168.0.1					
Accounts							
Events					Sa	ve	
MQTT							
🖑 SIP		ІРиб					

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 "UpdateCameraTime" or "UpdateCareaTime2" 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** 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.

XISA
 ✓ ✓ Date and time ✓ Network ✓ Security ▲ Unres ✓ Dreets ✓ Mott T Ø Storage ✓ Storage ✓ Onvis Ø Analytics metadata Ø Deterturs ✓ Accessories Ø Enconder

The Automatic date and time setting of the camera is disabled, and you can set the Controller's clock time to the camera using the sample programs "UpdateCameraTime" or "UpdateCameraTime2".



Precautions for Correct Use

If you do not use the sample programs "UpdateCameraTime" or "UpdateCameraTime2", configure the camera to use 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 A2-19 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

+ Add network storage	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.	
Onboard storage	Address	
SD card 1	192.168.250.10	
Ignore 🕜 🛈	Network share	
	apb_tmp	
Free: Unavailable Status: Disconnected	User	
File system: vfat Encrypted: No	APB	
	Password	
Mount storage device:		
V nmount	SMB Version ()	
	Auto 📼	
Autoformat ()	Add share even if connection test fails.	

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

Network stora	ge
Network s	storage (124.5 GB)
Ignore	0
Host:	192.168.250.10
Share:	apb_tmp
Free:	58%
Status:	Mounted
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.

0	Connection test didn't succeed	×
Error v	hile mounting network share.	

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

To add network storage for recordings, enter share. The network share is then tested, bour can use it for storage.	the details of and and mounte	a network ed before yo
Address		
192.168.250.10		
Network share		
apb_tmp		
User		
192.168.250.10\APB		
Password		
SMB Version ① Auto Add share even if connection test fails.		



Set the retention time for video files.

Network s	torage (124.5 GB)		
gnore 🔘	0	Retention time ① As long as possible ①	
Host: Share:	192.168.250.10 apb_tmp	1	[1 7000]
Free:	58%	24: 27:	_ [[/000]
Status:	Mounted	Table	
File system:	cifs	TOOIS	
Encrypted:	No	Test connection	O Forma
Jnmount, unbi	nd and remove network share:	Use tool	
Remov	e network storage		

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

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.

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

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.

	AXIS M3085-V Network Camera
🛠 Apps	
鐐 System	Stream profiles
🛗 Date and time	+ Add stream profile
Network	
Security	
💄 Users	
Events	
MQTT	
🕃 Storage	
🕞 Stream profiles	

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

ltem	Set value	
Name	StreamProfile1	
Video codec	H.264	





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.

		AXIS M3085-V Network Camera
🔁 Status		
□ Video	~	Stream profiles
Recordings		+ Add stream profile
🗩 Apps		
鑗 System	^	StreamProfile1 H.264
Time and location		

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 Prebuffer	(d)
	time (b) and Postbuffer time (c), before and after the camera's virtual input ON (a).	Video output (b) (c)
		Virtual input(a) →
Start/Save trigger method	This method records video for the period (c), which starts when the camera's virtual	(c)
	input turns ON (a) and ends when the input turns OFF (b).	Video output
		Virtual input(a) / (b) /

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

Click on Add a rule.

		AXIS M3085-V Network Camera		
Status				
□ Video	\sim	Rules Recipients Schedul	es Manual triggers	
ت) PTZ		+ Add a rule		
Recordings				
💕 Apps		Name	Conditions	
鐐 System	^			
Date and time				
Network				
Security				
🚢 Users				
Events				

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.

ltem	Subitem	Set value
Use this rule		Select this check box.
Name		Enter the rule name of your choice. In this exam-
		ple,"Pre/Post Trigger" is entered.
Condition	Use this condition as a trigger	Select this check box. ^{*1}
	Condition	Select Virtual input is active.
	Port	Select the camera's virtual input port to assign to this
		recording rule. In this example, 1 is selected.
Action		Select Record video.
	Storage	Select the Network storage.
	Stream profile	Select the stream profile that you created earlier. In
		this example, "StreamProfile1" is selected.
	Prebuffer	Set a period of pre-trigger sampling time of the au-
		tomation playback settings. In this example,"20"sec-
		onds is set.
	Postbuffer	Set a period of post-trigger sampling time of the au-
		tomation 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

3-5 Configuring Virtual Input

ltem	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 Virtual input is active.
	Port	Select the camera's virtual input port to assign to this recording rule. In this example, 2 is selected.
Action		Select Record video while the rule is active.
	Storage	Select the Network storage.
	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 corre-
		sponds to the Start/Save trigger method.
	Postbuffer	Set "00:00" (0 seconds) in the recording rule for the
		Start/Save trigger method.

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



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	

The recording rule has been registered.

Rules	Recipients	Schedules	Manual triggers	
+	Add a rule			
Nam	e		Conditions	Action
Pre	/Post Trigger 🦲	•	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

How to Use Sample Programs

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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 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 A2-19 for settings on the camera.

Model	OS version	Туре	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
AXIS P1375	10.12.166	Box	Available
	11.4.63		Does not work
AXIS P1378	11.9.60	1	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

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

*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.

- a. Use UpdateCameraTime2.(For more information, refer to 4-3 UpdateCameraTime2 on page 4-5.)
- b. Use the NTP server instead of using this program POU.

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 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.	
CameralP	Enter the IP address of the camera.	

2 Edit the execution conditions of the input variable *Execute* of UpdateCameraTime_instnance 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.

4-2-3 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.
CameralP	'192.168.250.90'	Enter the IP address of the camera.

T	his program has not been tested of lease change the following values	on camera OS to suit vour e	version 11.) nvironment	k. Enter the camera's authentication information and IP address as	s literal.
ι	JserName : User name of the came	era			
F	assword : Password for the camera	a			
(CameralP : IP address of the camera	а			
	U ClockTrigger	pdateCamera UpdateCam Execute	Time_instan eraTimeFB Done	ce	
	'root'—	UserName	Busy	— Busy	
	'password'—	Password	Error	— Error	
	'192.168.250.90'—	CameralP	ErrorID	— ErrorlD	

When an error occurs, *Error* will change to TRUE. For information on the error codes stored in *ErrorID*, refer to *4-6 Troubleshooting* on page 4-13.

4-3 UpdateCameraTime2

4-3-1 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 A2-19 for settings on the camera.

Model	OS version	Туре	UpdateCameraTime2 ^{*1}
AXIS M3085-V	11.4.63	Dome	Available
AXIS M3086-V	11.4.63		Available
AXIS M3088-V	11.9.60	1	Available
AXIS M3115-LVE	10.12.166	1	Available
AXIS M5075-G	11.4.63	PTZ	Available
AXIS M5525-E	8.40.19	1	Does not work
AXIS P1245	9.80.28	Modular	Unconfirmed
AXIS P1275	9.80.28	1	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	Вох	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

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

*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.

- a. Use UpdateCameraTime.(For more information, refer to *4-2 UpdateCameraTime* on page 4-3.)
- b. Use the NTP server instead of using this program POU.

4-3-2 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 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.
CameralP	Enter the IP address of the camera.
TimeOffset	Set the offset from UTC, which is specified to the Controller's time zone.

2 Edit the execution conditions of the input variable *Execute* of UpdateCameraTime2_instnance 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.

4-3-3 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.		
CameralP	'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 ve	rsions 10.x ar	nd 11.x. Enter camera credentials, IP address and offset from UT	C as literal
Please change the following values	to suit your e	nvironment.		
UserName : User name of the came	era			
Password : Password for the camer	а			
CameralP : IP address of the camer	a .			
TimeOffset : Offset from UTC of the	e time zone se	t in the contr	oller.	
-example	C + 0.00 cot T+	+0b00m		
For a time zone of U	C+9.00, set 1#	+91100111. #5h/15m		
For a time zone of U	C-9:00 set T#	-9h00m		
	pdateCamera]	Time2 instan	Ce.	
ClockTrigger		eraTimeFB2		
	Execute	Done		
'root'-	UserName	Busy	—Busy	
			_	
'password'-	Password	Error	— Error	
192 168 250 90'	CamoralP	ErrorID	FrrorID	
192.100.230.90 -	Califierair	EITOID		
T#9h00m-	TimeOffset			
	L			1

When an error occurs, *Error* will change to TRUE. For information on the error codes stored in *ErrorID*, refer to *4-6 Troubleshooting* on page 4-13.

4-4 PrePostTriggerRecording

4-4-1 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.

Model	OS version	Туре	PrePostTriggerRecording ^{*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		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

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

*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		

4-4-2 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 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.		
CameralP	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 Pre/Post trigger 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.

4-4-3 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.		
CameralP	'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 re- cording rule is assigned.		
		This sample program assumes that the camera's virtual input port "1" is as- signed to the recording rule that uses Pre/Post trigger method.		

or Pre/Post Trigger method. Inter the camera's authentication information, IP address and virtual input port number as literal.							
Change the following values to suit yo	ur environment.						
UserName : User name of the camera	JserName : User name of the camera						
Password : Password for the camera							
CameralP : IP address of the camera							
CameraPortNo : Virtual input port No.	of the corresponding came	ra					
	PrePostTriggerRecording_in	S					
PrePostTrigger	PrePostTriggerRecordingF	3					
	Execute						
File anna frianna	Done						
File save trigger	LicerName Busy						
for Pre/Post	Dusy	busy					
trigger method 'password'-	Password Erroy	Frror					
	Fassword Error						
192 168 250 901		ErrorID					
192.100.230.90 -							
10#1—	CameraPortino						
1	L]					

When an error occurs, *Error* will change to TRUE. For information on the error codes stored in *ErrorID*, refer to *4-6 Troubleshooting* on page 4-13.

4-5 TriggeredIntervalRecording

4-5-1 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	Туре	TriggeredIntervalRecording ^{*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		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**.

4-5-2 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.



r Pi

Set the following for each input variable of TriggeredIntervalRecording_ins.

Input Varia- bles	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.
CameralP	Enter the IP address of the camera.
CameraPort-	Specify the virtual input port number of the camera to which the created recording rule
No	is assigned.
	This sample program assumes that the camera's virtual input port "2" is assigned to
	the recording rule that uses Start/Save trigger method.
IntervalTime	Set the same time in seconds as Sampling time specified in the Variable log output
	settings of theStart/Save trigger method.
	This sample program assumes that the Sampling time in the Variable log output
	settings of the Start/Save trigger method in the Controller is set to 10 seconds.

2 Edit the execution conditions of the input variable *Execute* of TriggerdIntervalRecording_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.

4-5-3 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.
CameralP	'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 re- cording rule is assigned. This sample program assumes that the camera's virtual input port "2" is as- signed to the recording rule that uses Start/Save trigger method.
IntervalTime	T#10	Set the same time in seconds as Sampling time specified in the Variable log output settings of theStart/Save trigger method. This sample program assumes that the Sampling time in the Variable log output settings of the Start/Save trigger method in the Controller is set to 10 seconds.

For Start/Save method.				
Enter camera credentials, IP address, virt	ual input port numb	er and col	lection time as literal.	
Please change the following values to su	iit your environment			
UserName : User name of the camera				
Password : Password for the camera				
CameralP : IP address of the camera				
CameraPortNo : Virtual input port numb	er of the correspond	ling came	ra	
IntervalTime : Collection time		5		
	TriggeredIntervalRec	ording in		
StartTrigger	TriggeredIntervalPor	cordingEP		
		Согаттурь		
	Execute	Done		
Start trigger for				
Start/Save trigger 'root'-	UserName	Busy	— Busy	
method		_	_	
'password'—	Password	Error	— Error	
			5 10	
·192.168.250.90 [•] —	CameralP	ErrorID	— ErrorID	
10#2—	CameraPortNo			
I#10s—	Interval I ime			

When an error occurs, *Error* will change to TRUE. For information on the error codes stored in *ErrorID*, refer to *4-6 Troubleshooting* on page 4-13.

4-6 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 ex- ecution of the socket service in- struction.	Refer to the <i>Machine Automation Controller</i> <i>Troubleshooting Manual (Cat. No. W503)</i> for the event code with <i>5401</i> 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 occur- red for a socket service instruc- tion.	
16#2007	Socket Handle Out of Range	The handle that is specified for the socket service in- struction is not correct.	
16#2008	Socket Com- munications Resource Overflow	The maximum re- sources that you can use for socket service instruc- tions at the same time was exceed- ed.	
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 pass- word 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 virtu- al 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. IP address: 7 to 15 characters Username: 4 to 14 characters Password: 4 to 64 characters Check if the virtual input port number is correct. Port No.: 1 to 32

5

Controller Settings

5-1	Setting the Controller	5-2
5-2	Assigning Program POU to Task	5-3
5-3	Establishment of Trigger Conditions and Saving Video	5-5

5-1 Setting the Controller

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 we provide include the following. Use the program POU that suits your system.

Function	POU name	Description
Align the clock time on the Controller	UpdateCamera-	Refer 4-2-1 Functions on page 4-3 to
and camera	Time	see if your camera can be controlled.
	UpdateCamera-	Refer 4-3-1 Functions on page 4-5 to
	Time2	see if your camera can be controlled.
Control the camera according to the	PrePostTriggerRe-	Use this POU for Pre/Post trigger meth-
trigger method that specifies the varia-	cording	od.
ble log data range	TriggeredInterval-	Use this POU for Start/Save trigger
	Recording	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 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 POUs assigned to the task is displayed, so assign the program POU to execute.

In the example below, four program POUs are assigned.

🔚 Task Settings 🗙				
🗾 🔳	Program Assignment Set	ttings		
🔻 🖿 F	PrimaryTask			
B ,	Program name		Initial status	
	1 UpdateCameraTime	_	Stop	T
	2 UpdateCameraTime2	T	Stop	T
>	3 PrePostTriggerRecording	~	Stop	•
	4 TriggeredIntervalRecording	~	Stop	T
+				



3

Additional Information

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

Check if the **Initial status** of the program POUs that you want to execute is set to **Run**. Here, change the initial status of "UpdateCameraTime2" and "PrePostTriggerRecording" from **Stop** to **Run**.



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

5-3 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.

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" or "UpdateCameraTime2".



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 trigger condition satisfied.

The following global variables are defined in the sample programs.

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

When these variables rise, the following files are output.

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

6

Playing Back Variable Logs and Videos

6-1	How	o Start and Stop Playback	
	6-1-1	Procedure for Starting Playback	
	6-1-2	Procedure for Ending the Playback	
6-2	Trout	leshooting When a Video Cannot be Plaved Back	

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.

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

6-1-1 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 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.



4 In the **Start Playback** dialog box, specify the variable log and video data to use for playback.

5 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.

6-1-2 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 (

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**.

Q Search for apps, setting	s, and document	s		
Pinned				All apps >
Edge Settings	File Explorer			
	N			
Recommended				
Dev Home Recently added		ij	Microsoft Teams Recently added	
User				Ċ
Q Search			0	0 💼

2 Click on Apps, and then click Optional features.

← s	ettings			- c	ן	×
User Local Account		Apps				
Find	a setting Q		Installed apps Uninstall and manage apps on your PC		>	
— (3)	System Bluetooth & devices	E₽	Advanced app settings Choose where to get apps, archive apps, uninstall updates		>	
•	Network & internet	ē	Default apps Defaults for file and link types, other defaults		>	
1	Apps	Do	Offline maps Downloads, storage location, map updates		>	
•	Accounts Time & language	œ	Optional features Extra functionality for your device		>	
∞ ★	Gaming Accessibility	Ø	Apps for websites Websites that can open in an app instead of a browser		>	
() ()	Privacy & security Windows Update		Video playback Video adjustments, HDR streaming, battery options		>	

- × Settings < Apps > Optional features User Local Account Find a setting Q 3 WMIC 6.40 MB 🗸 System 3 Windows Media Player Legacy 52.2 MB 🗸 Bluetooth & devices Network & internet 3 Windows PowerShell ISE 6.82 MB 🗸 Personalization Apps 1 🔡 WordPad 3 6.21 MB 🗸 Accounts Time & language E **Related settings** + 2 Gaming 0 <u>=</u> More Windows features Accessibility X Privacy & security Get help Windows Update 3
- **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 $\ensuremath{\text{OK}}$ button.


A1

Specifications of Function Block POUs

This section explains the specifications of the function block POU included in the sample programs.

A1-1 Specif	ications of Function Block UpdateCameraTimeFB	A1-2
A1-1-1	Input Variables	A1-2
A1-1-2	Output Variables	A1-2
A1-2 Specif	ications of Function Block UpdateCameraTimeFB2	A1-4
A1-2-1	Input Variables	A1-4
A1-2-2	Output Variables	A1-4
A1-3 Specif	ication of Function Block PrePostTriggerRecordingFB	A1-6
A1-3-1	Input Variables	A1-6
A1-3-2	Output Variables	A1-6
A1-4 Specif	ication of Function Block TriggeredIntervalRecordingFB	A1-8
A1-4-1	Input Variables	A1-8
A1-4-2	Output Variables	A1-8
A1-5 Timing	J Charts	A1-10
A1-6 Error C	Codes	A1-11

A1-1 Specifications of Function Block UpdateCameraTimeFB

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

Graphic expression			ST expression
UpdateCameraTi	me_instance	e	UpdateCameraTime_instance(
UpdateCame	raTimeFB		Execute;=,
 Execute 	Done-	-	UserName;=,
11	D		Password;=,
Userivame	Busy	-	CameralP:=,
Password	Error		Offset;=,
CONTRACTOR OF		2	Done=>,
CameralP	ErrorID-	-	BUSY=>,
	11.751.0		Error=>,
			ErrorID=>);

A1-1-1 Input Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial val- ue
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

A1-1-2 Output Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial val- ue
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		

Variable	Name	Data type	Description	Valid range	Unit	Initial val- ue
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		

A1-2 Specifications of Function Block UpdateCameraTimeFB2

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

Graphic expression	on	ST expression
UpdateCameraTime2_in: UpdateCameraTimeF Execute Di UserName B Password E CameraIP Erro TimeOffset	stance B2 one — susy — prior — priD —	UpdateCameraTime2_instance(Execute;=, UserName;=, Password;=, CameraIP:=, Offset;=, Done=>, BUSY=>, Error=>, ErrorID=>);
UpdateCameraTimeF — Execute Di — UserName B — Password E — CameraIP Erro — TimeOffset	B2 one — uusy — rror — orID —	Execute;=, UserName;=, Password;=, CameraIP:=, Offset;=, Done=>, BUSY=>, Error=>, ErrorID=>);

A1-2-1 Input Variables

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

A1-2-2 Output Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial val- ue
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		

Variable	Name	Data type	Description	Valid range	Unit	Initial val- ue
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		

A1-3 Specification of Function Block Pre-PostTriggerRecordingFB

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

Graphic expression	ST expression
PrePostTriggerRecordingFB_ins	PrePostTriggerRecordingFB_ins(
PrePostTriggerRecordingFB Execute Done	Execute;=,
	UserName;=,
- UserName Busy-	Password;=,
- Password Error -	CameralP:=,
- CameralP ErrorID -	CameraPortNo:=,
- CameraPortNo	Done=>,
	BUSY=>,
	Error=>,
	ErrorID=>);

A1-3-1 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
CameraPort- No	Virtual input port	INT	Virtual input port of the cam- era	1 to 32		None

A1-3-2 Output Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial val- ue
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		

Variable	Name	Data type	Description	Valid range	Unit	Initial val- ue
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 Specification of Function Block TriggeredIntervalRecordingFB

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

Graphic express	ion	ST expression
TriggeredIntervalRecording TriggeredIntervalRecordi – Execute D – UserName – Password – CameraIP Err – CameraPortNo – IntervalTime	gFB_ins ngFB Done – Busy – Error – forID –	TriggeredIntervalRecordingFB_ins(Execute;=, UserName;=, Password;=, CameraIP:=, CameraPortNo:=, Done=>, BUSY=>, Error=>, ErrorID=>);
– UserName – Password – CameraIP Err – CameraPortNo – IntervalTime	Busy – Error – rorID –	Password;=, CameraIP:=, CameraPortNo:=, Done=>, BUSY=>, Error=>, ErrorID=>);

A1-4-1 Input Variables

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

A1-4-2 Output Variables

Variable	Name	Data type	Description	Valid range	Unit	Initial val- ue
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		

Variable	Name	Data type	Description	Valid range	Unit	Initial val- ue
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		

A1-5 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 while the execution of the FB is in progress, *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). Refer to *A1-6 Error Codes* on page A1-11 for the meanings and value.
- If *Execute* changes to FALSE before execution on the FB is ended, *Done* and *Error* are TRUE only for one task period.
- If *Execute* remains TRUE even after execution of the FB is ended, the output values of *Done* and *Error* are retained.

• Timing Chart for Normal End



• Timing Chart for Error End



A1-6 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 execu- tion of the socket service instruction.	Refer to the <i>Machine Automation Controller Troubleshooting</i> <i>Manual (Cat. No. W503)</i> for the event code with <i>5401</i> ap- pended to the upper 4 digits of the Error code. For example, if the error code is 16#2003, refer to the description of event
16#2006	Socket Time- out	A timeout occurred for a socket serv- ice instruction.	code 54012003 hex in the manual.
16#2007	Socket Handle Out of Range	The handle that is specified for the socket service in- struction is not cor- rect.	
16#2008	Socket Com- munications Resource Overflow	The maximum re- sources that you can use for socket service instruc- tions at the same time was exceed- ed.	
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 cam- era.
16#2010	Invalid number of characters in IP address, username, or password, or incorrect virtu- al 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. IP address: 7 to 15 characters Username: 4 to 14 characters Password: 4 to 64 characters Check if the virtual input port number is correct. Port No.: 1 to 32

A2

Setting Examples

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

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A2-1-1	Initial Setting of Cameras	A2-2
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A2-2 Examp	ole of Video Recording Settings with a High Frame Rate	A2-16
A2-3 Examp	bles of Computer Settings	A2-19
A2-3-1	Example of Setting to Use a Computer as Network Storage	A2-19
A2-3-2	Example of Changing IP Address of a Computer	A2-28

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 staring 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.

Set the IP address of the computer to have the same network address as the camera (192.168.0.90), which is the initial IP address of the camera to be connected. In this example, to set the computer's network address to 192.168.0.X, configure the settings 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".

r 🕸 😘	Туре	e to filter
Vame	IP Address	Serial Number
AXIS M5525-E -	192.168.250.90	
AXIS M3085-V -	192.168.0.90	

• You can download "AXIS IP Utility" from www.axis.com.

4XIS 🔺	Search		Q	S 0
	SOLUTIONS PRODUCTS LEARNING	SUPPORT	PARTNER WHERE TO BUY	
AXIS IP asy discovery of I	Utility P address			
ERVIEW COMPATIBLE	EPRODUCTS SUPPORT AND RESOURCES AXIS IP Utility helps you set the IP address of an network are automatically discovered and displ mask and Default router) or configure the devic	Axis network vider ayed. Assign netwo re to obtain its IP ad	o product. Axis devices on the rk parameters (IP Address, Subn idress from <u>DHCP</u> , AXIS IP Utility	FREE DOWINLOAD
	user interface is available in English, French, Ge The Axis device and the client computer mu	rman, Italian, Japar st be on the same	nese and Spanish. subnet/network segment.	
	HOW TO FIND THE SERIAL NUMBER	lownloa	d	
XIS IP Utility				
TEGRITY CHECKSUM			RELEASE NO	TES DOWNLOAD
XIS IP Utility ersion 4.18.0 ITEGRITY CHECKSUM			RELEASE NO	TES 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 A2-28.
- **2** Enter the IP address of the camera in the browser. In this example, enter 192.168.0.90.

A2-1-1 Initial Setting of Cameras

	New tab	× +	
С	▲ 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.

AXIS M5525-E PTZ Dome Network Camera	
Welcome.	
Set a password for the root account.	
🚊 root	
۵ ······	1
ê	
Password strength: Medium	
English	
Share non-personal browser data with Axis Communications AB. This helps us improve the application and user experience. Learn more.	
Create login	

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.

192.168.0.90/ca	amera/index.html	AN	☆	C)
Sign in to	access this site			
Authorizatio Your connec	on required by http://19 ction to this site is not s	2.168.0.90 ecure	1	
Username	root			
Password	•••••			
	Sign i	in (Cancel	



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

		Date and time
Manual IP and manua	II DNS V	Automatic date and time
IP address	Subnet mask	Year Month Day
192.168.250.90	255.255.255.0	Hour Min
Default router		() 11 44
192.168.250.10		Use 24-hour format
Domain name		Time zone
Domain name		GMT+09 (Osaka, Sapporo, Tokyo, Seoul)
+		
Primary DNS server	Secondary DNS server	Daylight saving time adjustment
0.0.0.0	0.0.0.0	

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.

5



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.

A				AXIS M5525	E PTZ Dome Netv	vork Camera			± 0	0
		Automa Mutoma	d time 0 arr Month Day 2023 07 14 yarr 18 59 2 Use 24-hour format		Time GMT Dayli	zone r' (Dublin, Lisbon, Lon ght saving lime adjust	don, Reykjavik) ment 💽 o	¥		
	Image Stream	Overlay Audio	PTZ Privacy mask	Apps S	System					~
	Language Control Control Contr	Date and time	Orientation Conservation Security	Users Users Storage	۵۰۰۰ ONVIF ا	SIMP	© Detectors	X Maintenance	Plain config	

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**.

	ONS		AXIS M5525-E PTZ D	ome Network Camera	1	-	٥	0
		Storag	e					
		Netw	ork storage Setup					
		Onbo Forma	ard storage It new cards to ext4	••				
			nsert SD card					
Image	Stream Over	lay Audio PT.	Z Privacy mask	Apps System				~
			513 213	÷	Quinte	SNIMP		
	Language	Date and time	Orientation	Users	ONVIF	SNMP		5
	۲	Ē	۲	5				
	TCP/IP	AVHS	Security	Storage	I/O ports	Events		

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

Network storage	
-	
Host	
192.168.250.10	
Share	
apb_tmp	
The share requires login 🔵 o	
The share requires login o	Connect
The share requires login Cancel	Connect
The share requires login Cancel Cancel Onboard storage Format new cards to ext4	Connect

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.

torage
Network storage
Host
192.168.250.10
Share
apb_tmp
The share requires login
Username
APB
Password
Cancel Connect

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	
Network storage	
Server (100.0 GB) Host: 192.168.250.10 Share: apb_tmp Free: 81.0 GB Status: Okay	

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

Storage	
Network storage	
Server (100.0 GB)	~
Host: 192.168.250.10	
Share: apb_tmp	
Status: Okay	
Write-protect	
Keep recordings up to	
7 days 💌)
Tools	
Erase all 🔻 🍕	
	`
Safely remove the storage	



1

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.

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.



On the Live View window, click the Settings - Streams tab, and then click Stream profiles.

2 Click Create new in the Stream profiles window.

Stream profiles	Create new
Name	
Click above to create a profile	T.
	Close
	Close

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

New	r profile	
Nam	•	
Nev	vProfile	
Desc	ription	
•	H.264 () MJPEG	
•	General	^ ^
	Resolution	
\checkmark	1920x1080 (16:9)	T
	Frame rate	
\checkmark	0 [030] (0 = ∞) fps	
	Compression	
\checkmark	0 [0100]	
Enc	oding	~
Aud	io	~
0		•
	Cancel Cr	eate

内

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 pe- riod (d) before and after the camera's virtu-	(d)
	al input ON (a) and the periods are speci- fied in the camera's settings Pre-trigger time (b) and Post-trigger time (c).	Video output (b) (c)
		Virtual input(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).	(C)
		Video output
		Virtual input (a) (b)

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



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

AX				AXIS M552	5-E PTZ Dome Net	work Camera			20	0
				★ Client stream inform	nation					
		70	ヤットポジション	Video Resolution 800x450 Stream type RTSP (WebSocket) Encoding H.284 Main (4.1) Frame rate 0.00 fps Bitrate 0 kbit/s	Health Uptime 00:00:00 Buffer 167 ms Drophed fremes 0 of 4 Refreshed 1 time		10 . 1	53		
1	mage Stream	Overlay	Audio PTZ	Privacy mask Apps	s System		v - 1	' K 3		~
		i	38	+	Center	SNMP	\otimes	4	9	
	Language	Date and time	Crientation	Users	ONVIF	SNMP SNMP	Detectors	A Maintenance	Plain config	
	Language	Date and time	다. Orientation	Users		SNMP	Detectors	Maintenance	Plain config	
	Language S TCP/IP	Date and time	Orientation Orientation Security	Users	ONVIF	SNMP	Detectors	Maintenance	Plain config	

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

40	ction rules Recipier	nts Schedules R	ecurrences	Manual triggers	
ct	ion Rule List				
	Name	Trigger	Schedule	Action	Recipient
~]	VI1_Pre240Post300	Input Signal - Virtual Inputs	-	Record Video	()=)
~	VI2_Pre600Post300	Input Signal - Virtual Inputs	ll. a	Record Video	0 = 1
~	VI3_Pre600Post600	Input Signal - Virtual Inputs		Record Video	8 8
~	VI4_Pre600Post1200	Input Signal - Virtual Inputs	-	Record Video	-
✓]	VI5_Pre5Post5	Input Signal - Virtual Inputs	i di	Record Video	121
	VI6_periodmode	Input Signal - Virtual Inputs		Record Video	

- **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.

A2

Action Ru	ile Setup	
General		
Enable rule		
Name:	VI1_Pre20Post10	Select Input Signal.
Condition		
Trigger:	Input Signal	Start condition only
	Virtual Inputs	
	1	Select Virtual Inputs.
	Active: 💿 Yes	No
Schedule:	Always (No Schedule)	New Schedule
Additional condition	ons	
Add	Select Record Video .	port No. specified in the sample program.
Actions		
Type:	Record Video	Profiles created in setting of Stream
Stream profile:	ContinousTrigger	profile.
Duration:	 Pre-trigger time 20 secon While the rule is active Post-trigger time 10 secon 	Input the same time as the Pre-trigger sampling time .
Storage:	Network Share	Input the same time as the Post-trigger sampling time .
▲	ОК	Cancel

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	Mores.			
Enable rule				
Name:	Start&RecordTrigger	Select	t Input Signal.	
Condition			input oightin	
Trigger:	Input Signal		✓ ✓ Start condit	tion onl
	Virtual Inputs			3
	2		Select Virtual Inputs.	
	Active:	O No		
Schedule:	Always (No Schedule)	$\overline{}$	New Schedule	
Additional conditions Add Wait at least 00:00:0 Actions	ot Record Video .	ule (max 23:5 Profiles cr	Input the Virtual input port No. specified in the sample program.	
Type:	Record Video	Stream pr	ofile are listed.	
Stream profile:	ContinousTrigger	Select a li		
Duration:	Pre-trigger time 20 s While the rule is active Post-trigger time 10	second(s) second(s)		
Storage:	Network Share		~	
	ОК	Cancel		
•				•

r R

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.

	AXIS F9111 Main Unit	© 0 🛱 🛈 🖯 :
🔁 Status		
□ Video		Capture mode 🕤
辈 Installation		1920x1080 @ 25/30 fps Power line frequency ①
Image		60 Hz Change
🕪 Stream		

2 Click the **Change** button.

The Change capture mode window is displayed.

Change capture mode						
A change of capture mode can affect other settings. Check the following settings after the change:						
- Exposure zones - Guard tours - Image overlays - Preset positions		- Privacy masks - Stream profiles - Video resolution - View areas				
Ci Pi	apture mode 1920x1080 @ 25/30 fps ower line frequency () 60 Hz]	~			
		Cancel	Save and restart			

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

Change capture mode		
A change of capture mode can affect settings after the change:	other settings	. Check the following
- Exposure zones - Guard tours - Image overlays - Preset positions	- Privacy ma: - Stream pro - Video resol - View areas	sks files ution
Capture mode		
1280x720@175/180fj	ps	
Power line frequency)	
60 Hz 📼		
	Cancel	Save and restart

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

F9111 Main Unit	Ø	?	9	٥	θ	:
	Capture mode 🛈					
	1920x1080 @ 25/30 fp:	5				
	Power line frequency (ī				
	60 Hz			Ch	ange	

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.

ltem	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.

← :	Settings				×
	User Local Account	Acc	ounts		
Find	a setting Q		USER Local Account Administrator		
_	System				
U	Bluetootn & devices	83	Your info	>	
-	Network & internet		Profile photo		
1	Personalization		Email & accounts	\$	
	Apps		Accounts used by email, calendar, and contacts		
۱ 🚨	Accounts	P	Sign-in options	>	
5	Time & language		Windows Hello, security key, password, dynamic lock		
•	Gaming	\$	Family Manage your family group, edit account types, and device	>	
×	Accessibility		permissions		-
	Privacy & security	65	Other Users Accounts that have device access, work or school users, kiosk	>	
8	Windows Update		assigned access		

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

← Settings	- D >	<
User	Accounts > Other Users	
Local Account	Other users	
Find a setting Q	Add other user Add account	
System		
8 Bluetooth & devices	Set up a kiosk	
Network & internet	Kiosk Turn this device into a kiosk to use as a Get started	
Personalization	digital sign, interactive display, or other things	

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	APB	Enter the user name used for authentication when access-
use this PC?		ing to network storage from the camera.
Make it secure.	Password	Enter the password used for authentication when access- ing to network storage from the camera. Enter the same password in both fields.
In case you forget	(Select the item	For Windows 11 Pro version 22H2, you should enter all 3
your password	and enter the ap- propriate value.)	items, Security question 1 to Security question 3.

icrosoft account	3
Create a user for this PC	
If this account is for a child or teenager, consider selecting Back and creating a Microsoft account. When younger family members log in with a Microsoft account, they'll have privacy protections focused on their age.	
If you want to use a password, choose something that will be easy for you to rememb but hard for others to guess.	er
Who's going to use this PC?	
АРВ	
Make it secure.	
••••••	
In case your forget your password	
Next Back	1
NOX DUCK	

User "APB" has been created.

\leftarrow Settings		- 0 ×
User Local Account	Accounts > Other Users	S
Find a setting	Q Add other user	Add account
System	АРВ	
8 Bluetooth & devices	Local account	~)
💎 Network & internet		
🥖 Personalization	Set up a kiosk	
Apps	Kiosk Turn this device into a kiosk to use as a	Get started
Accounts	digital sign, interactive display, or other things	

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

Windows (C:)		×	+			
$\leftarrow \rightarrow \uparrow$	C		> Thi	is PC	> Wind	dows (C:)
+ New -	D	6		Ē	⑩	↑↓ So
🔀 Pictures 🔹 🖈	1	Vame	/	/		1
🕖 Music 🔹 🖈		apb_tm	p 🗡			3
💽 Videos 🔹 🖈		PerfLog	s			1
<u></u>	, e	Program	n Files			(
✓ 💻 This PC		Program	n Files (x86	5)		e
> 🖳 Windows (C:)		shared				
> ն Network	1	Users				

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

🕀 New 🗸 🔥	c î e	x 0 () ()	
🔀 Pictures 🛛 🖈	Name	Open Open in new tab	Enter
🕐 Music 🔹 🖈	apb_tmp PerfLogs	Open in new window	
	Program File Program File	 Pin to Quick access Pin to Start 	
 Windows (C:) 	shared	Compress to ZIP file	
> 🐙 Network	Users	Properties	Alt+Enter
7 items 1 item selected			

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

📒 apb_t	mp Prop	erties					×
General	Sharing	Security	Previous V	ersions/	Customize		
Netwo Netwo Not Sł	rk File and apb_tri Not Sh vrk Path: nared	I Folder Sh np nared	aring				
Advan Set cu advan	ced Sharin Istom perm ced sharin A <u>d</u> vanced	ng nissions, cr ng options. d Sharing	eate multiple	e shares,	and set oth	ner	
Password Protection People must have a user account and password for this computer to access shared folders. To change this setting, use the <u>Network and Sharing Center</u> .							
		0	ĸ	Cance		Apply	

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.
			×
\leftarrow	😝 Network access		
	Choose people to share with		
	Type a name and then click Add, or click the arrow to find someone.		
	(PC name)\APB	~ 🗡 <u>A</u> dd	
	Name	Permission Level	
	🙎 User	Owner	
	I'm having trouble sharing		
		S <u>h</u> are Ca	ncel

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

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.

v to find someone.
✓ <u>A</u> dd
Permission Level
Read 🔻
Owner

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

Choose people to share with	
Type a name and then click Add, or click t	he arrow to find someone.
	∼ <u>A</u> dd
Name	Permission Level
APB	Read 💌 🗸 Read
🔏 User	Owner Read/Write
	Remove

7) Activate the modified permission level.

Make sure the **Permission Level** for the user **APB** is **Read/Write** and click the **Share** button.

			\times
\leftarrow	📴 Network access		
	Choose people to share with		
	Type a name and then click Add, or click the arrow to find someone.		
		∽ <u>A</u> dd	
	Name	Permission Level	
	APB	Read/Write 🔻	
	🐍 User	Owner	
	I'm having trouble sharing		
		Share Cance	!

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.

		×
<	🗧 📴 Network access	
	Your folder is shared.	
	You can <u>e-mail</u> someone links to these shared items, or <u>copy</u> and paste the links into another app.	
	apb_tmp \\ (comupter name) .\apb_tmp	-
	Show me all the network shares on this computer.	
		one

The folder has been shared. Click the Close button.

📒 apb_tmp	Prope	erties			×	
General Sha	aring	Security	Previous Versions	Customize		
Network Files	Network File and Folder Sharing apb_tmp Shared Network Path: \\(computer name)\apb_tmp Share					
Advanced Set custon advanced	Advanced Sharing Set custom permissions, create multiple shares, and set other advanced sharing options.					
Password Protection People must have a user account and password for this computer to access shared folders. To change this setting, use the <u>Network and Sharing Center</u> .						
		Clo	Canc	el <u>A</u> pp	ly	

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".



From the Windows Start menu, click Settings.

Q Search for apps, settings,	and documents			
Pinned				All apps >
Edge Settings	File Explorer			
Recommended				
Dev Home Recently added		ij	Microsoft Teams Recently added	
User				Ċ
Q Search	<u></u>		0 🖿 🤇	0

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. A2

← Settings	-	o x
User	Network & internet > Ethernet	
	Set a data limit to help control data usage on this netw	c
Find a setting Q		
System	IP assignment: Automatic (DHCP)	
8 Bluetooth & devices	DNS server assignment:	
📘 💎 Network & internet	Automatic (DHCP)	
Personalization	Link speed (Receive/Transmit): Copy	

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

Edit IP settings		
Automatic (DHCP)		~
		o
Save	Cancel	

5 Select Manual.

Edit IP settings	
Automatic (DHCP)	
Manual	
Save	Cancel



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

Edit IP settings	
Manual	~
IPv4	
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 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

A3-1	About Digest Authentication	A3-2
A3-2	List of VAPIX Commands Used in the Sample Program	A3-3
A3-3	Virtual Input	A3-4

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A3-1 About Digest Authentication

The communication between the camera and the Controller in this sample program uses 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 blocks (FBs) included in the sample programs control the camera using the following VA-PIX commands.

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 ^{*1}
	UpdateCameraTimeFB2	time.cgi ^{*2}

*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 Prebuffer time (b) and Postbuffer time (c), before	Video output (b) (c)		
	and after the camera's virtual input ON (a).	Virtual input(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).	(c)		
		Virtual input(a) / (b) /		

A4

A4

Tips

A4-1	Check Items	When Using	Untested	Cameras	44-	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 *2-1-1 Cameras that Omron Has Verified to Operate Correctly* on page 2-3, perform the following checks.

- 1 Check the camera's OS version.
 - 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.



 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.
 - 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.



Not Found

The requested URL was not found on this server.



Check whether VAPIX command for controlling virtual input is accepted.

 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.



 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.

A4

← C ▲ Not secure 192	.168.0.90/axis-cgi/virtualinput/deactivate.cgi	A»	☆	CD	€≣	Ē
This XML file does not appear to have	e any style information associated with it. T	The do	ocument tr	ee is s	hown ł	pelow.
<pre>v<virtualinputresponse 200="" http:="" schemaversion="1.
dis.com/vapix/http_cgi/virtualinput1
gi/virtualinput1_0.xsd" www.w3.org="" xmlns="htt xmlns:xsi=" xsi:schemalocation="http://www.ais.com/vapix/http_c, v<GeneralError></th><th><pre>>://www.axis.com/vapix/http_cgi/virtual
//XMLSchema-instance"> argument: schemaversion and port <th>input 0" orDesc</th><th>1" cription></th><th></th><th></th><th></th></virtualinputresponse></pre>	input 0" orDesc	1" cription>				

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.

Tips

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