Automation Playback

Camera control sample program

INSTRUCTIONS

Man. No. | W641-E1

Introduction

This sample program manual (hereinafter, this manual) describes sample programs for operating AXIS Communications network cameras from the OMRON Machine Automation Controller type NX502-1X00.

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Related materials

The related documents in this document are organized as shown below. See also.

Document number	Document name
W631-E	Playback data Collection system Environmental construction procedures for Buffalo NAS
W632-E	Playback data Collection system Environmental construction procedures for Synology NAS
W639-E	NX-series CPU Unit Automation Playback User's Manual

Revision history

The revision symbol is attached to the end of Man.No. shown at the lower left of the cover.

Revised symbol	Date of revision	Details of revision
A	Jul 2023	First edition

Table of Contents

1 Precautions for use

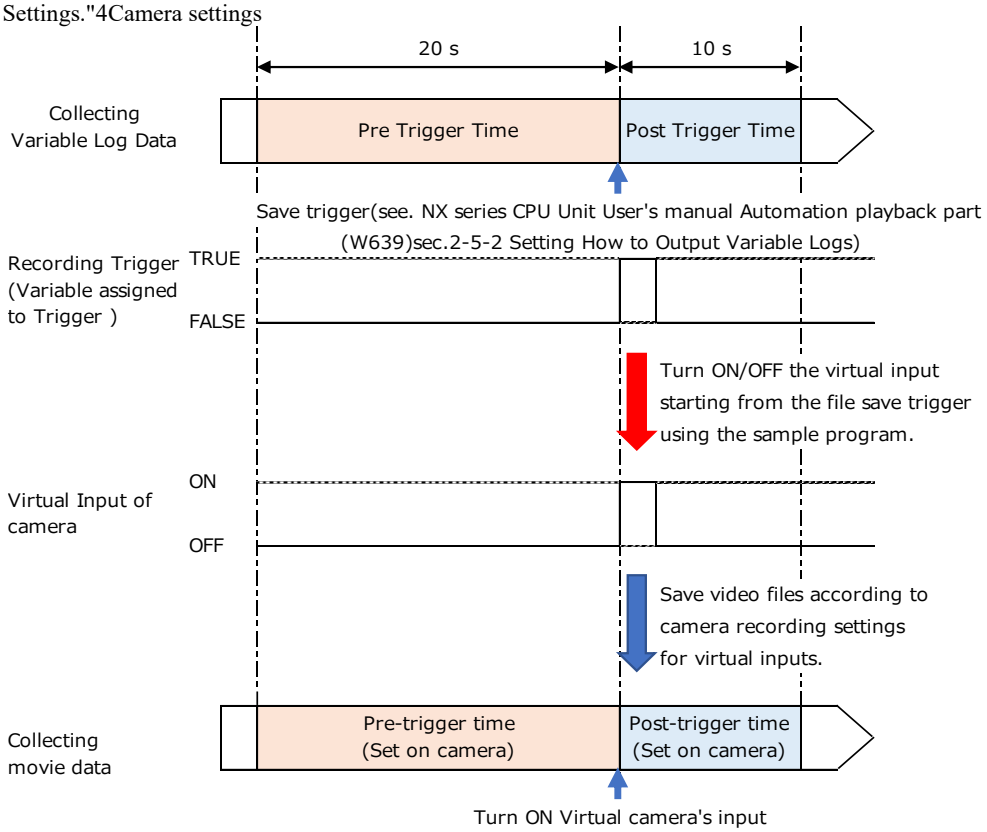
Before using this sample program, fully confirm that the expected results can be obtained in your environment. Omron does not guarantee the operation of the camera.

This sample program assumes that AXIS Communications (hereafter Axis) network cameras (hereafter cameras) are used in a local network isolated from an external network. Keep in mind that Sysmac Studio projects will contain plain text for the camera-certified user and password.

- Do not use the camera's user name and password on other devices, including the controller.
- Consider the following measures in preparation for theft or leakage of the camera's user name and password.
  - Set a password for the project and use the data protection function.
    - The certification information of the camera is described as a constant (literal) by referring to the notation of the sample program.
      (The initial value of the variable is not subject to encryption by the data protection function.)
  - Controlling access to SD memory cards and their destinations from which projects are backed up
    - More specifically, entry and exit management and media management

2 Sample program overview

In this sample program, a command is sent to the camera by a socket communication command to control the camera.
By using this sample program, the virtual input of the camera can be controlled, for example, as shown in the figure below, and the corresponding video file can be recorded in the variable log and in seconds. To record a movie file, you need to set the camera separately. For details on the camera settings, see section 4, "Camera Settings."4Camera settings



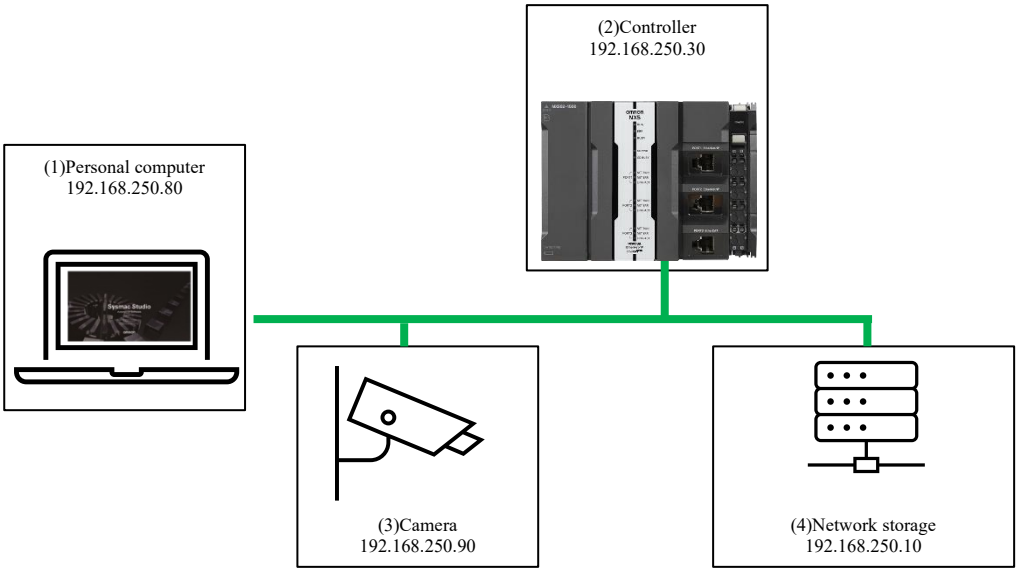
This sample program consists of the following program POU. For details, see section 5, Using the Sample Program.5Using the Sample Program

Programmed POU	Functional Description
UpdateCameraTime	Align the controller time information with the camera time settings.
UpdateCameraTime2	Align the controller time information with the camera time settings.
PrePostTriggerRecording	A movie file that supports the "Before and After Trigger" method is saved.
TriggeredIntervalRecording	Save a video file that supports the "Start/Save Trigger" method.

3 System Configuration and Usage Procedure

3.1 System configuration

The operation of this sample program is verified by the following system configuration.



No	Name of equipment	Description	IP address
(1)	Personal computer	Computer with Sysmac Studio (versionversion 1.55) installed on it.	192.168.250.80
(2)	Controller	Model NX502-1X00 (Unit version 1.63) This manual assumes that the following settings have been made for the Automation Playback function. [Collect Setting 1] ● Variable log output setting with pre-trigger acquisition time of 20 seconds and post-trigger acquisition time of 10 seconds in the pre-and post-trigger method ● Variable log output setting with start/save trigger method and acquisition time of 10 seconds [Collect Setting 2] ● Variable log output setting with pre-trigger acquisition time of 20 seconds and post-trigger acquisition time of 10 seconds in the pre-and post-trigger method ● Variable log output setting with start/save trigger	192.168.250.30

		method and acquisition time of 10 seconds	
(3)	Camera	Made by Axis. For models whose operation has been confirmed by Omron, refer to the separate table [List of Cameras whose Operation has been Confirmed]. This manual assumes that the following settings have been made. User: root Password: password	192.168.250.90
(4)	Network storage	Storage for saving video files. Connect to the camera with a SMB. This document describes the save directory as apb_tmp.	192.168.250.10

[List of Cameras Confirmed by Operation]
The operation of this sample program is verified with the following cameras. For more information, please refer to the explanation of each POU. Note that Omron does not guarantee the operation of the camera.

Type	OS Version	Shape	Maximum resolution	Max. fps
AXIS M3085-V	11.4.63	Dome type	1920×1080	25/30
AXIS M3086-V	11.4.63		2688×1512	25/30
AXIS M3115-LVE	10.12.166		1920×1080	25/30
AXIS M5075-G	11.4.63	PTZ	1920×1080	50/60
AXIS M5525-E	8.40.19		1920×1080	25/30
AXIS P1245	9.80.28	Sensor/Unit separate type	1920×1080	25/30
AXIS P1275	9.80.28		1920×1080	25/30
AXIS P1375	10.12.166	Box type	1920×1080	50/60
	11.4.63			

3.2 Procedure for using

By setting in the following order, you can use this sample program to record video files corresponding to the variable log.
This manual explains 1 and 2.

1. Camera Settings (Chapter 4)4
2. Setting the sample program (Chapter 5)5
3. Starting the camera and controller
4. Program execution
5. Trigger generation

4 Camera settings

This chapter explains the camera setup items for using the sample program. Use the COMPUTER's Web Browser to configure the settings.
Refer to your camera's manual for instructions on how to update your camera's firmware and how to configure settings according to the version.

In "6. Reference: Camera Settings" we have summarized the detailed procedure examples for using the following cameras. Refer to this if necessary.6Reference: Camera Settings Screen

Type	OS Version	REFERENCE
M3085-V	11.4.63	6.1
M5525-E PTZ	8.40.8	6.2

4.1 Initial camera startup settings

When starting for the first time, you need to configure networking settings such as IP addressing. After setting, access is possible only by entering the user name and password.

The main setting items are as follows.

1. Set a password on the camera.
2. Set the power frequency, etc. according to the operating environment.
3. Sets IP addressof the camera.
4. Adjust the camera position while checking the image on the live view screen of the camera.

4.2 Setting the time

To align the camera time with the controller time using the sample program UpdateCameraTime or UpdateCameraTime2 described later, turn OFF the date and time synchronization settings on the camera. Also, the time zone of the camera matches the time zone set in the controller.

The main setting items are as follows. The settings are made on the live view screen of the camera.

1. Set date and time synchronization to OFF.
2. Set the time zone of the camera to match the time zone set in the controller.

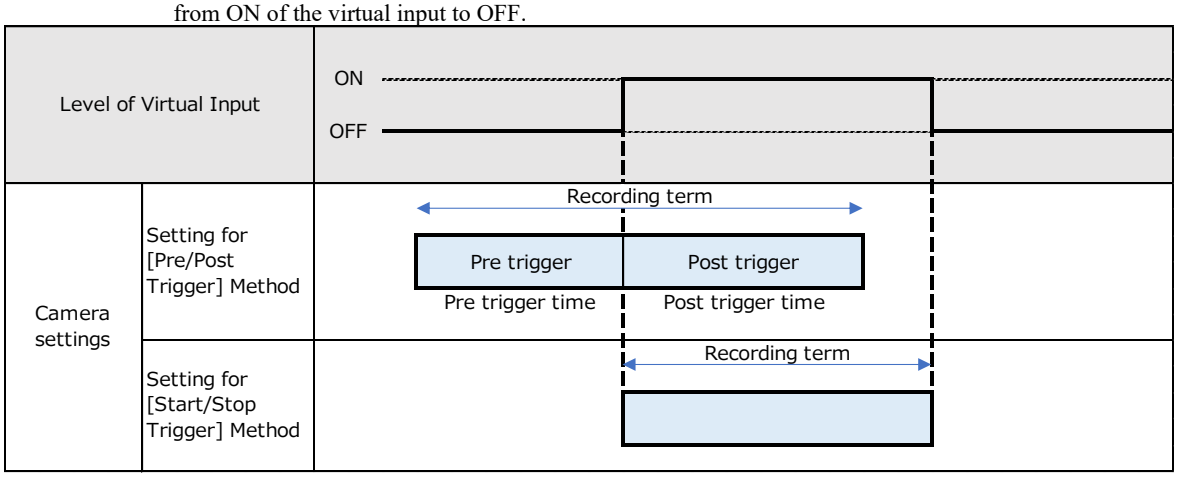
If you do not use UpdateCameraTime or UpdateCameraTime2, consider using NTP servers to align the camera-time with the controller-time.

4.3 Setting Recording Rules

Recording instructions are obtained by controlling ON/OFF of the virtual entry (Virtual Input) from the controllers.
The camera allows you to set recording rules that correspond to the status of the virtual input.
Set the recording rules of the camera for recording at the timing corresponding to the "before and after trigger" and "start and save trigger" methods, which are the variable log output settings of the automation playback function.

The main setting items are as follows. The settings are made on the live view screen of the camera.

1. Specify the destination for saving video files.
2. Sets the video profile. Use H.264 for video codecs.
3. Configure recording rules for virtual inputs.
   The setting is necessary to match the method of setting the variable log output of automation playback.
   The settings corresponding to the front-to-back trigger input specify that the recording of a period of [Pre trigger time] duration and [Post trigger time] duration is to be saved from the start of ON of the virtual entry.
   In the settings corresponding to the start/save trigger method, set the recording to be saved for the period from ON of the virtual input to OFF.



A) Setting corresponding to trigger back-and-forth type

① Set the corresponding virtual input port. Specify the port to be set here from the controller.

② Set to record before and after the trigger.
③ Set the pre-buffer time to match the pre-trigger time of the variable log output setting and the post-buffer time to match the post-trigger time.

B) Sets corresponding to start/save trigger method
① Set the corresponding virtual input port. Specify the port to be set here from the controller.
② Set the trigger to record throughout the valid period.

4.4 Restarting the camera and checking the settings

Check if the camera settings are saved correctly after restarting the camera.

- Setting time synchronization
- Configuring your Time Zone
- Setting Recording Rules

5 Using the Sample Program

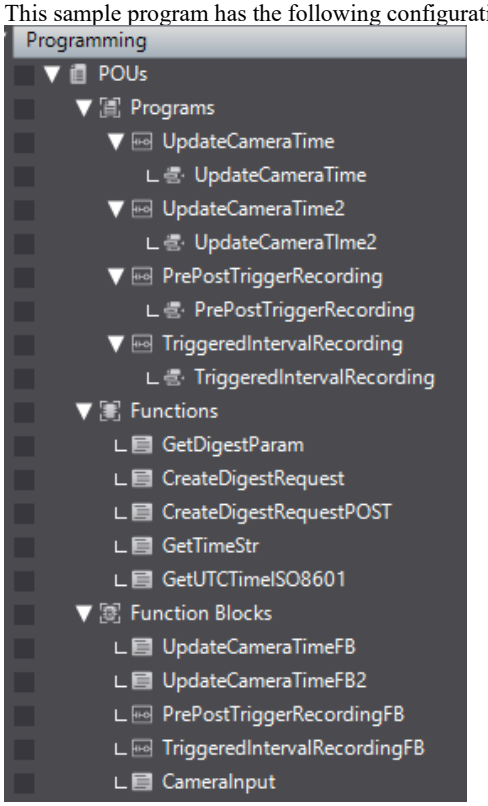
5.1 Security-related information

This sample program assumes that the camera is used in a local network isolated from an external network. Note the following points because the project will contain the user name and password that correspond to the camera's authentication information in plain text.

- Do not use the camera's user name and password on other devices, including the controller.
- Consider the following measures in preparation for theft or leakage of the camera's user name and password.
  - Set a password for the project and use the data protection function.
    - The certification information of the camera is described as a constant (literal) by referring to the notation of the sample program.
      (The initial value of the variable is not subject to encryption by the data protection function.)
  - Controlling access to SD memory cards and their destinations from which projects are backed up
    - More specifically, entry and exit management and media management

5.2 Overview

This sample program has the following configuration. Program POU are assigned to the task. They are used.



The functions of POU are as follows.

[Programming POU]

POU designation	Functional Description
UpdateCameraTime	Set the controller time information to the camera.
UpdateCameraTime2	Set the controller time information to the camera. Used with OS version-type 11.x.
PrePostTriggerRecording	Save the video corresponding to the trigger before and after method.
TriggeredIntervalRecording	Save the video corresponding to the start/save trigger method.

[Function POU]

POU designation	Feature Overview
GetDigestParam	This function extracts the parameters of Digest authorization.
CreateDigestRequest	This function creates a request message for Digest authorization.
CreateDigestRequestPOST	This function creates a request message for Digest authorization.
GetTimeStr	This function obtains the present time of the controllers in String format.
GetTimeStrISO8601	This function acquires the present time of the controller in ISO8601 format.

[Function Block POU]

POU designation	Feature Overview
UpdateCameraTimeFB	This function block sets the time information of the controller to the camera.
UpdateCameraTimeFB2	This function block sets the time information of the controller to the camera.
PrePostTriggerRecordingFB	This function block saves the video corresponding to the trigger back-and-forth expression of Automation Playback.
TriggeredIntervalRecordingFB	This function block saves the video corresponding to the start/save trigger method of automation playback.
CameraInput	This is a function block that ON/OFF virtual input of cameras.

In addition, the sample program assumes that the camera and network storage are already started when the controller starts.

5.3 Using UpdateCameraTime

5.3.1 Function

The time of the controller can be set on the camera by using this program POU. The camera time setting is in seconds. When using this programmed POU, turn OFF [Date and time synchronization settings] on the camera to make the time zone on the camera the same as the controller. (4.2 Setting the time)4.2Setting the time
If you use NTP server to set the camera time, you do not need to use this program POU or OFF [Set date and time synchronization] on the camera.

The operation check status of this programmed POU is as follows.

- Omron does not guarantee the operation of the camera.
- If OS version of your camera is 11.x or later, consider using a NTP server without using UpdateCameraTime2 described later or this program POU to set the time with the controller.

Type	OS Version	Shape	UpdateCameraTime
AXIS M3085-V	11.4.63	Dome type	×
AXIS M3086-V	11.4.63		×
AXIS M3115-LVE	10.12.166		○
AXIS M5075-G	11.4.63	PTZ	×
AXIS M5525-E	8.40.19		○
AXIS P1245	9.80.28	Sensor/Unit separate type	○
AXIS P1275	9.80.28		○
AXIS P1375	10.12.166	Box type	○
	11.4.63		×

(○:Operation confirmed ×: Not operating)

5.3.2 Use Procedure

0. Turn OFF the date and time synchronization settings on the camera. Set the time zone to the same as the controller.
1. For each entry in UpdateCameraTime_instance, enter the following:

Input variable	Set value
Username	Camera user name
Password	Password for the camera user name
CameraIP	IP addressing of the camera

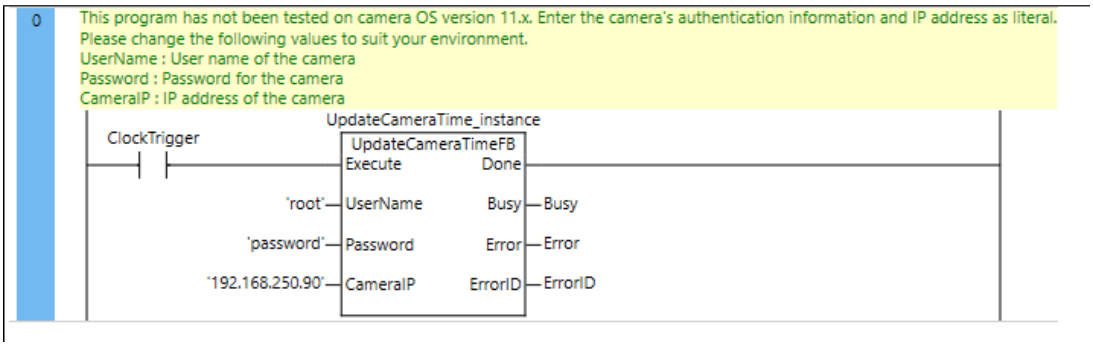
2. UpdateCameraTime_instance entry Execute system conditions can be edited to suit your needs. (In the example program, TRUE of ClockTrigger is the condition.)
3. Turn ON the power to the controllers while the camera and network storage are running.

5.3.3 Setting example

■Internal variable

Name	Data type	Initial value	Input range
ClockTrigger	BOOL	-	True/False
UpdateCameraTime_instance	UpdateCameraTimeFB		
Busy	BOOL	False	-
Error	BOOL	False	-
ErrorID	WORD	16#0	-

■LD display



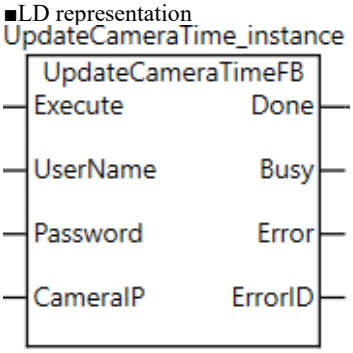
When an error occurs, Error becomes True. For an explanation of the error codes stored in ErrorID, refer to 5.7 Troubleshooting.5.7

5.3.4 Explanation of function block UpdateCameraTimeFB

■Function

Set the controller time information to the camera.

■LD representation



■ST representation

```
UpdateCameraTime_Instance( Execute:=
                           UserName:=
                           Password:=
                           CamaeraIP:=
                           Done=>
                           Busy=>
                           Error=>
                           ErrorID=>)
```

■Input variable

Variable	Name	Data type	Description	Scope	Unit	Initial value
Execute	Start	BOOL	True: Execute False: Do not execute	True,False	-	False
UserName	User name	STRING	User name registered on the camera	4 to 14 characters	-	None
Password	Password	STRING	Passwords registered with the camera	4 to 64 characters	-	None
CameraIP	IP address	STRING	IP addressing of the camera	7 to 15 characters	-	None

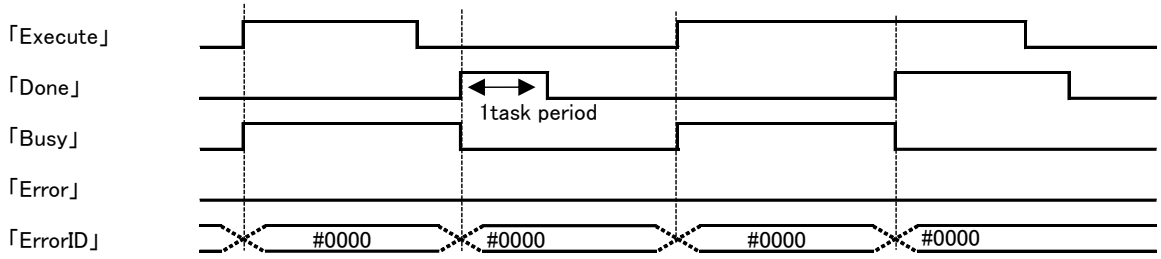
■Output variable

Variable	Name	Data type	Description	Scope	Unit	Initial value
Done	Completion	BOOL	True : Successful completion False: Abnormal end, execution in progress, or execution condition not met	True,False	-	-
Busy	Running	BOOL	True: Running False: Not running	True,False	-	-
Error	Error	BOOL	True : Abnormal termination False: Normal completion, execution in progress, or execution condition is not satisfied	True,False	-	-
ErrorID	Error code	WORD	Error ID at abnormal termination 16#0 at normal end	16#0～16#FFFF	-	-

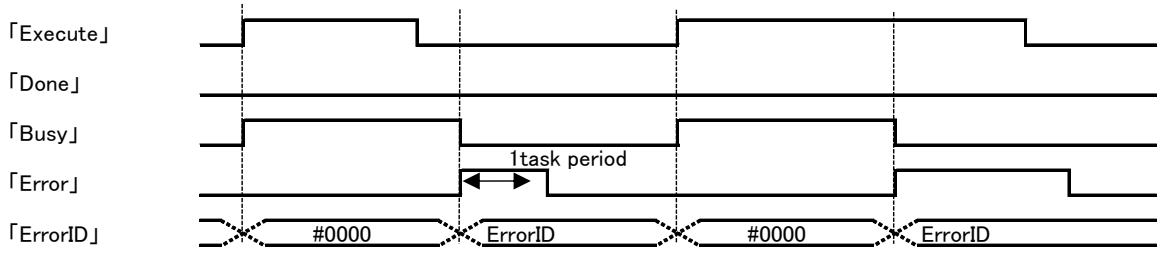
■Input/output variable
None

■Timing chart

- At the same time as the rising edge of "Execute" (startup), "Busy" (running) becomes True.
- When the answer reception from thecamera is successful, "Done" (complete) is True.
- If an error occurs while this FB is running, "Error" (error) will be True and "Busy" (running) will be False. By referring to the value output to "ErrorID" (error code), you can know the reason of the error. See chapter 5.7 Troubleshooting for values and meanings.5.7
- If "Execute" (start) is False prior to completion of executing this FB, only one task cycle is True for "Done" (complete) and "Error" (error).
- If "Execute" (start) is still True after this FB is executed, Done (complete) and output (error) are retained.
- Timing chart at normal completion



- Timing chart for abnormal completion



5.4 Using UpdateCameraTime2

5.4.1 Function

The time of the controller can be set on the camera by using this program POU. The camera time setting is in seconds. When using this programmed POU, turn OFF [Date and time synchronization settings] on the camera to make the time zone on the camera the same as the controller. (4.2 Setting the time)4.2Setting the time
If you use NTP server to set the camera time, you do not need to use this program POU or OFF [Set date and time synchronization] on the camera.

The operation check status of this programmed POU is as follows.

- Omron does not guarantee the operation of the camera.
- If OS version of your camera is less than 10.x, consider using a NTP server without using UpdateCameraTime described above or this program POU to set the time with the controller.

Type	OS Version	Shape	UpdateCameraTime2
AXIS M3085-V	11.4.63	Dome type	○
AXIS M3086-V	11.4.63		○
AXIS M3115-LVE	10.12.166		○
AXIS M5075-G	11.4.63	PTZ	○
AXIS M5525-E	8.40.19		×
AXIS P1245	9.80.28	Sensor/Unit separate type	-
AXIS P1275	9.80.28		-
AXIS P1375	10.12.166	Box type	○
	11.4.63		○

(○:Operation confirmed ×: No operation-: Not confirmed)

5.4.2 Use Procedure

0. Turn OFF the date and time synchronization settings on the camera. Set the time zone to the same as the controller.
1. For each entry in UpdateCameraTime2_instance, enter the following:

Input variable	Set value
Username	Camera user name
Password	Password for the camera user name
CameraIP	IP addressing of the camera
TimeOffset	Offset-time from UTC applied to the time zone of the controller

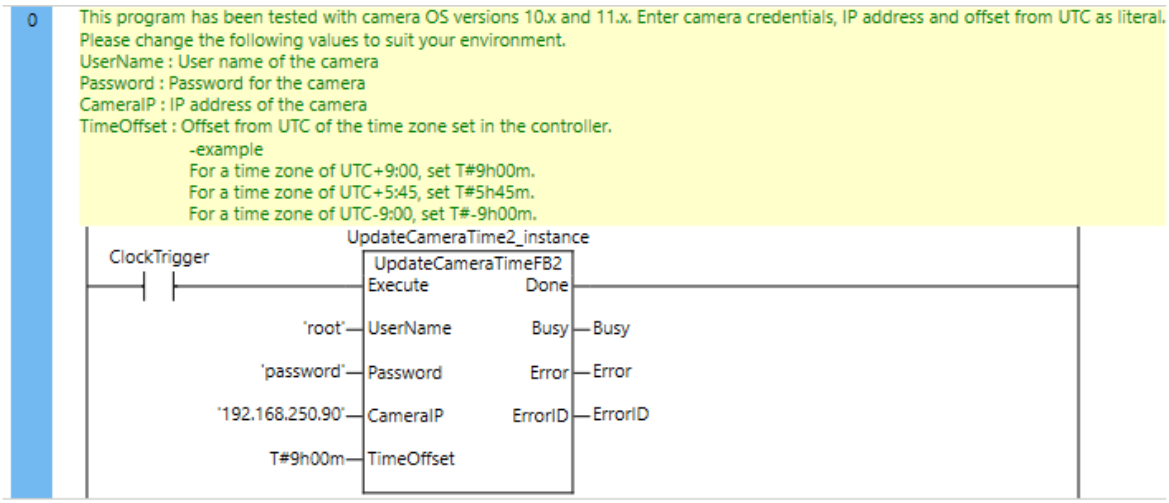
2. UpdateCameraTime2_instance entry Execute system conditions can be edited to suit your needs. (In the example program, TRUE of ClockTrigger is the condition.)
3. Turn ON the power to the controllers while the camera and network storage are running.

5.4.3 Setting example

■Internal variable

Name	Data type	Initial value	Input range
ClockTrigger	BOOL		True/False
UpdateCameraTime2_instance	UpdateCameraTimeFB2	-	-
Busy	BOOL	False	-
Error	BOOL	False	-
ErrorID	WORD	16#0	-

■LD display



When an error occurs, Error becomes True. For an explanation of the error codes stored in ErrorID, refer to 5.7 Troubleshooting.5.7

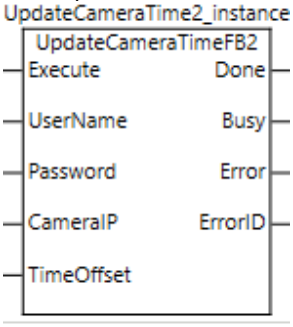
5.4.4 Explanation of function block UpdateCameraTimeFB2

■Function

Set the controller time information to the camera.

■LD representation

UpdateCameraTime2_instance



■ST representation

```
UpdateCameraTime2_Instance(Execute:=
                           UserName:=
                           Password:=
                           CamaeraIP:=
                           TimeOffset:=
                           Done=>
                           Busy=>
                           Error=>
                           ErrorID=>)
```

■Input variable

Variable	Name	Data type	Description	Scope	Unit	Initial value
Execute	Start	BOOL	True: Execute False: Do not execute	True,False	-	False
UserName	User name	STRING	User name registered on	4 to 14	-	None

			the camera	characters		
Password	Password	STRING	Passwords registered with the camera	4 to 64 characters	-	None
CameraIP	IP address	STRING	IP addressing of the camera	7 to 15 characters	-	None
TimeOffset	Offset time	TIME	Offsetting from UTC (Coordinated Universal Time)	T#-12h00m~ T#14h00m		T#0h00m

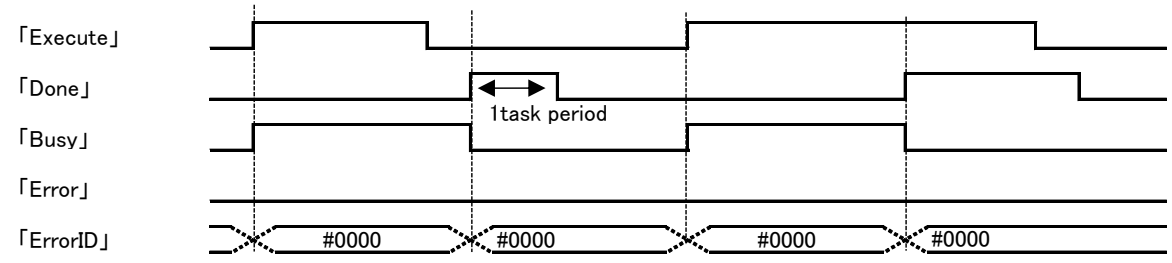
■Output variable

Variable	Name	Data type	Description	Scope	Unit	Initial value
Done	Completion	BOOL	True : Successful completion False: Abnormal end, execution in progress, or execution condition not met	True,False	-	-
Busy	Running	BOOL	True: Running False: Not running	True,False	-	-
Error	Error	BOOL	True : Abnormal termination False: Normal completion, execution in progress, or execution condition is not satisfied	True,False	-	-
ErrorID	Error code	WORD	Error ID at abnormal termination 16#0 at normal end	16#0～16#FF FF	-	-

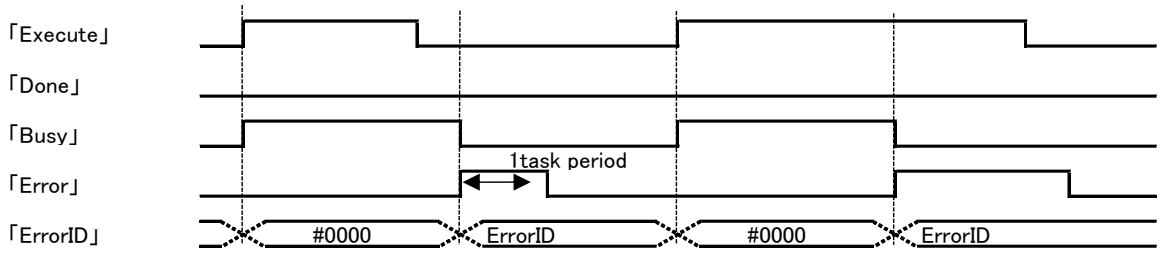
■Input/output variable
None

■Timing chart

- At the same time as the rising edge of "Execute" (startup), "Busy" (running) becomes True.
- When the answer reception from thecamera is successful, "Done" (complete) is True.
- If an error occurs while this FB is running, "Error" (error) will be True and "Busy" (running) will be False. By referring to the value output to "ErrorID" (error code), you can know the reason of the error. See chapter 5.7 Troubleshooting for values and meanings.5.7
- If "Execute" (start) is False prior to completion of executing this FB, only one task cycle is True for "Done" (complete) and "Error" (error).
- If "Execute" (start) is still True after this FB is executed, Done (complete) and output (error) are retained.
- Timing chart at normal completion



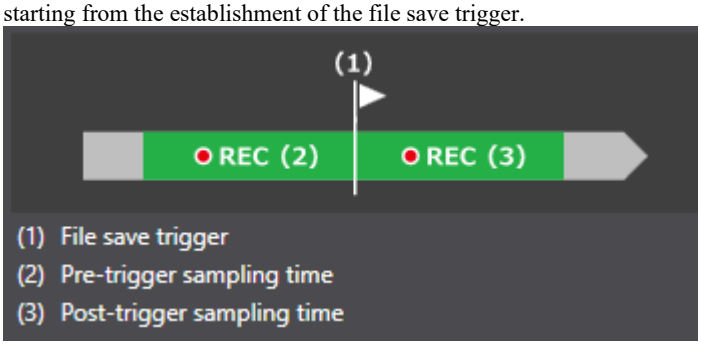
- Timing chart for abnormal completion



5.5 How to use PrePostTriggerRecording

5.5.1 Function

By using this programming POU, video is saved before and after the trigger set by the camera's recording rule, starting from the establishment of the file save trigger.



The operation check status of this programmed POU is as follows. Note that Omron does not guarantee the operation of the camera.

Type	OS Version	Shape	PrePostTriggerRecording
AXIS M3085-V	11.4.63	Dome type	○
AXIS M3086-V	11.4.63		○
AXIS M3115-LVE	10.12.166		○
AXIS M5075-G	11.4.63	PTZ	○
AXIS M5525-E	8.40.19		○
AXIS P1245	9.80.28	Sensor/Unit separate type	○
AXIS P1275	9.80.28		○
AXIS P1375	10.12.166	Box type	○
	11.4.63		○

(○:Operation confirmed ×: Not operating)

(Reference)
Depending on the camera format and the subject, the movie may be recorded with a time that does not meet the time set for Pre-trigger time. In addition, as shown in the table below, it is confirmed that the upper limit that can be set for Pre-Trigger times differs depending on OS version of the camera.

OS Version	Pre-trigger setting (high limit)
8.40.19	9999 seconds
9.80.28	59 seconds
10.12.166	59 seconds
11.4.63	99 seconds

5.5.2 Use Procedure

Create a camera recording rule that matches the controller settings in advance.

0. Creates a camera set rule with settings tailored to the trigger fore-and-aft expression.
1. For each PrePostTriggerRecording_ins entry, set the following:

Variable	Value to be set to initial value
UserName	Camera user name
Password	Password for the camera user name
CameraIP	IP addressing of the camera
CameraPortNo	Virtual input port number of the camera to which the created recording rule is assigned In this sample program, the virtual input port number of the camera, which is assigned the recording rule created according to the trigger front-rear method, is set to 1.

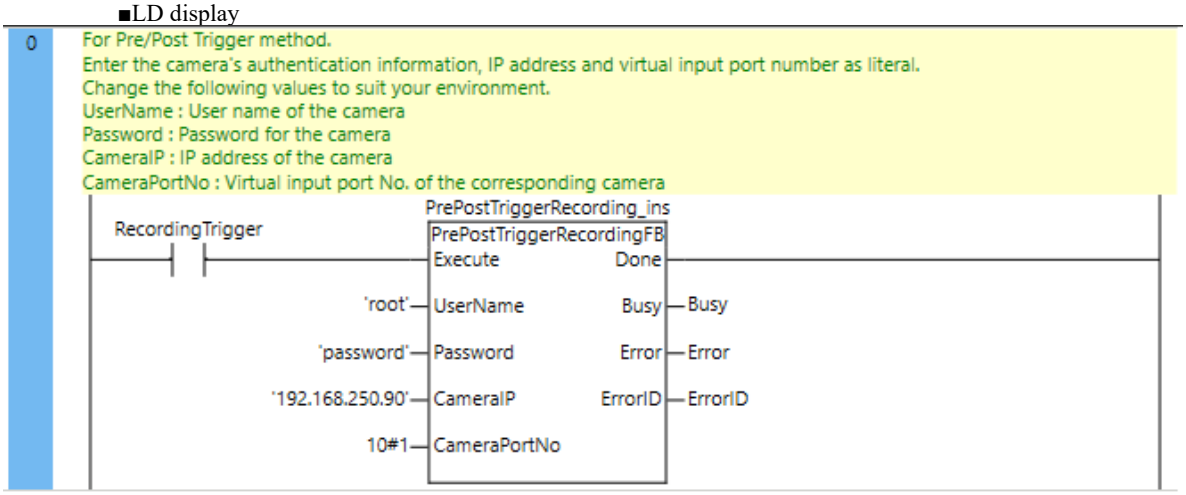
2. PrePostTriggerRecording_ins entry Execute system conditions can be edited to suit your needs. In this sample program, videos are saved with the set acquisition settings based on TRUE of RecordingTrigger.
3. While the camera and network storage are running, PrePostTriggerRecording_ins entry Execute is executed.

5.5.3 Setting example

■Internal variable

Name	Data type	Initial value (input example)
RecordingTrigger	BOOL	False
PrePostTriggerRecordingFB_ins	PrePostTriggerRecordingFB	-
CameraPortNo	INT	10#1
Busy	BOOL	False
Error	BOOL	False
ErrorID	WORD	16#0

■LD display



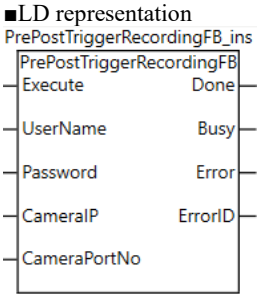
When an error occurs, Error becomes True. For an explanation of the error codes stored in ErrorID, refer to 5.7 Troubleshooting.5.7

5.5.4 Function Block PrePostTriggerRecording Explanation

■Function

Recording corresponding to the trigger back-and-forth type is performed.

■LD representation



■ST representation

```
PrePostTriggerRecordingFB_ins(Execute:=
                              UserName:=
                              Password:=
                              CamaeraIP:=
                              CameraPortNo:=
                              Done=>
                              Busy=>
                              Error=>
                              ErrorID=>)
```

■Input variable

Variable	Name	Data type	Description	Scope	Unit	Initial value
Execute	Start	BOOL	True: Execute False: Do not execute	True,False	-	False
UserName	User name	STRING	User name registered on the camera	4 to 14 characters	-	None
Password	Password	STRING	Passwords registered with the camera	4 to 64 characters	-	None
CameraIP	IP address	STRING	IP addressing of the camera	7 to 15 characters	-	None
CameraPortNo	Virtual input port	INT	Virtual input port of the camera	1~32	-	None

■Output variable

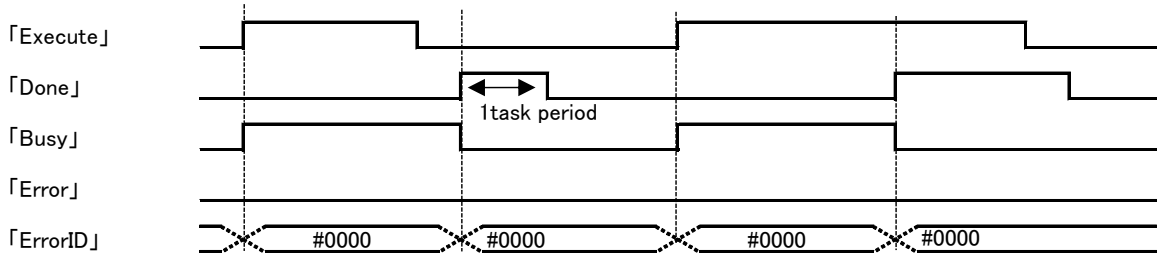
Variable	Name	Data type	Description	Scope	Unit	Initial value
Done	Completion	BOOL	True : Successful completion False: Abnormal end, execution in progress, or execution condition not met	True,False	-	-
Busy	Running	BOOL	True: Running False: Not running	True,False	-	-
Error	Error	BOOL	True : Abnormal termination False: Normal completion, execution in progress, or execution condition is not satisfied	True,False	-	-
ErrorID	Error code	WORD	Error ID at abnormal	16#0～16#FF	-	-

			termination 16#0 at normal end	FF		

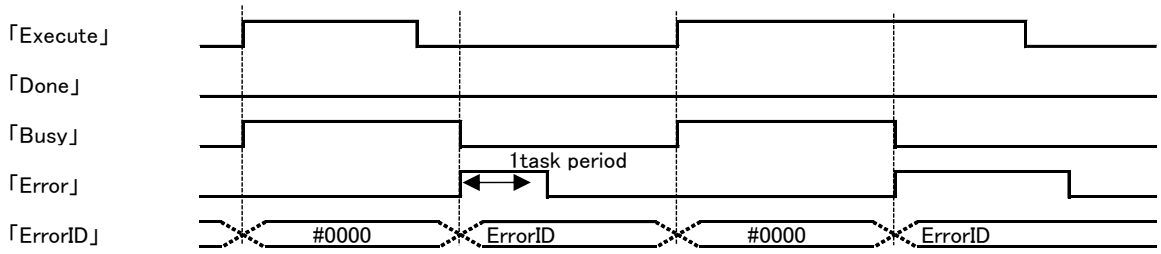
■Input/output variable
None

■Timing chart

- At the same time as the rising edge of "Execute" (startup), "Busy" (running) becomes True.
- When the answer reception from thecamera is successful, "Done" (complete) is True.
- If an error occurs while this FB is running, "Error" (error) will be True and "Busy" (running) will be False. By referring to the value output to "ErrorID" (error code), you can know the reason of the error. See chapter 5.7 Troubleshooting for values and meanings.5.7
- If "Execute" (start) is False prior to completion of executing this FB, only one task cycle is True for "Done" (complete) and "Error" (error).
- If "Execute" (start) is still True after this FB is executed, Done (complete) and output (error) are retained.
- Timing chart at normal completion



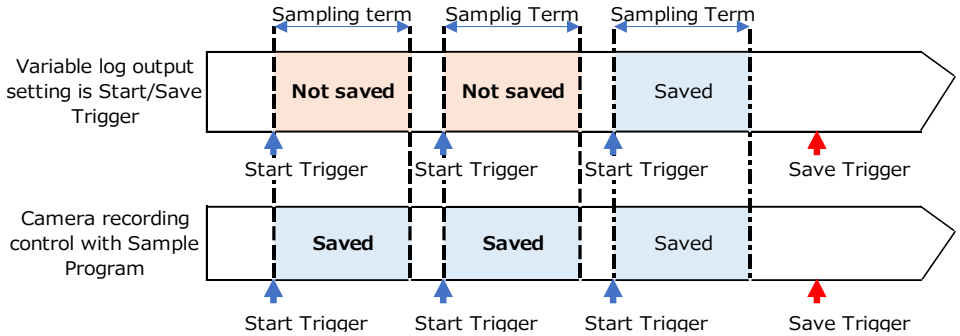
- Timing chart for abnormal completion



5.6 Using TriggeredIntervalRecording

5.6.1 Function

By using this programming POU, the moving image of the collection time set in the variable log output setting is saved starting from the rising edge of the start trigger. The variable log is output only when the save trigger is met, but the video is saved regardless of whether the save trigger is met.



The operation check status of this programmed POU is as follows. Note that Omron does not guarantee the operation of the camera.

Type	OS Version	Shape	TriggeredIntervalRecording
AXIS M3085-V	11.4.63	Dome type	○
AXIS M3086-V	11.4.63		○
AXIS M3115-LVE	10.12.166		○
AXIS M5075-G	11.4.63	PTZ	○
AXIS M5525-E	8.40.19		○
AXIS P1245	9.80.28	Sensor/Unit separate type	○
AXIS P1275	9.80.28		○
AXIS P1375	10.12.166	Box type	○
	11.4.63		○

(○:Operation confirmed ×: Not operating)

5.6.2 Use Procedure

Create a camera recording rule that matches the controller settings in advance.

0. Create a camera recording rule with a setting that matches the start and save trigger method.
1. For each TriggeredIntervalRecording_ins entry, set the following:

Variable	Value to be set to initial value
UserName	Camera user name
Password	Password for the camera user name
CameraIP	IP addressing of the camera
CameraPortNo	Virtual input port number of the camera to which the created recording rule is assigned In this sample program, the virtual input port number of the camera, which is assigned a recording rule created according to the start/save trigger method, is set to 2.
IntervalTime	Collection time set in the variable log output setting of the start/save trigger method In this sample program, the collection time set in the variable log output setting of the start and save trigger method is set to 10 seconds.

2. TriggerdIntervalRecording_ins entry Execute system conditions can be edited to suit your needs. In this example program, the start point is the rising edge of the internalvariable RecordingTrigger so that the video is saved with the set collection setting.
3. While the camera and network storage are running, TriggerdIntervalRecording_ins entry Execute is executed.

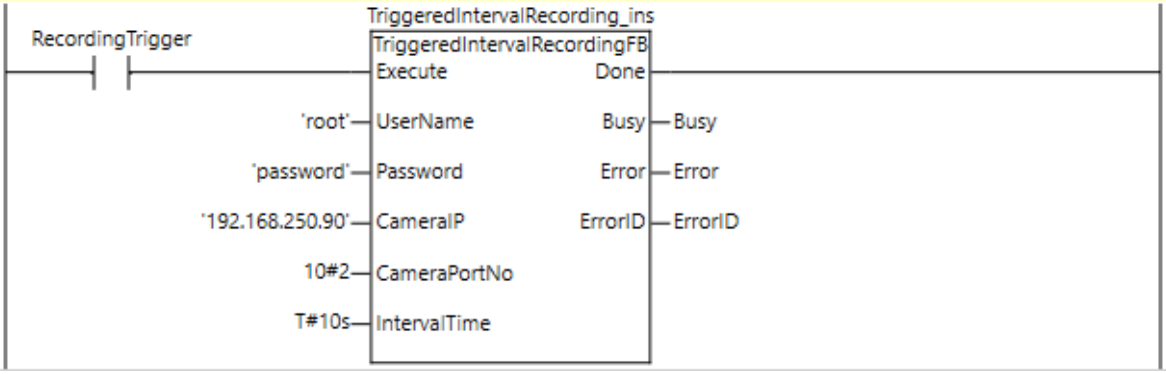
5.6.3 Setting example

■Internal variable

Name	Data type	Initial value (input example)
RecordingTrigger	BOOL	False
TriggeredIntervalRecordingFB_ins	TriggeredIntervalRecordingFB	-
CameraPortNo	INT	10#2
IntervalTime	TIME	T#10 s
Busy	BOOL	False
Error	BOOL	False
ErrorID	WORD	16#0

■LD display

```
For Start/Save method.
Enter camera credentials, IP address, virtual input port number and collection time as literal.
Please change the following values to suit your environment.
UserName : User name of the camera
Password : Password for the camera
CameraIP : IP address of the camera
CameraPortNo : Virtual input port number of the corresponding camera
IntervalTime : Collection time
```



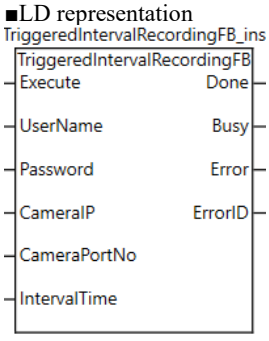
When an error occurs, Error becomes True. For an explanation of the error codes stored in ErrorID, refer to 5.7 Troubleshooting.5.7

5.6.4 Explanation of function block TriggeredIntervalRecordingFB

■Function

Recording is performed according to the start/save trigger method.

■LD representation



■ST representation

TriggeredIntervalRecordingFB_ins(Execute:=
UserName:=
Password:=
CamaeraIP:=
CameraPortNo:=
Done=>
Busy=>
Error=>
ErrorID=>)

■Input variable

Variable	Name	Data type	Description	Scope	Unit	Initial value
Execute	Start	BOOL	True: Execute False: Do not execute	True,False	-	False
CameraIP	IP address	STRING	IP addressing of the camera	7 to 15 characters		
UserName	User name	STRING	User name registered on the camera	4 to 14 characters		
Password	Password	STRING	Passwords registered with the camera	4 to 64 characters		
CameraPortNo	Virtual input port	INT	Virtual input port of the camera	1~32		
IntervalTime	Collection time	TIME	Collection time of the video	Accord to the data type		

■Output variable

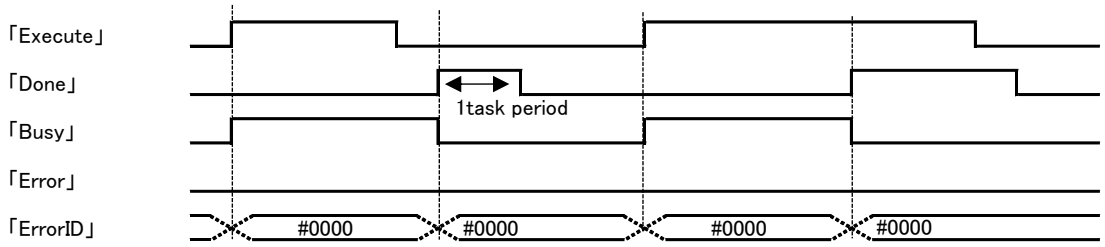
Variable	Name	Data type	Description	Scope	Unit	Initial value
Done	Completion	BOOL	True : Successful completion False: Abnormal end, execution in progress, or execution condition not met	True,False	-	-
Busy	Running	BOOL	True: Running False: Not running	True,False	-	-
Error	Error	BOOL	True : Abnormal termination False: Normal completion, execution in progress, or execution condition is not satisfied	True,False	-	-
ErrorID	Error code	WORD	Error ID at abnormal termination 16#0 at normal end	16#0～16#FFFF	-	-

■Input/output variable
None
■Timing chart

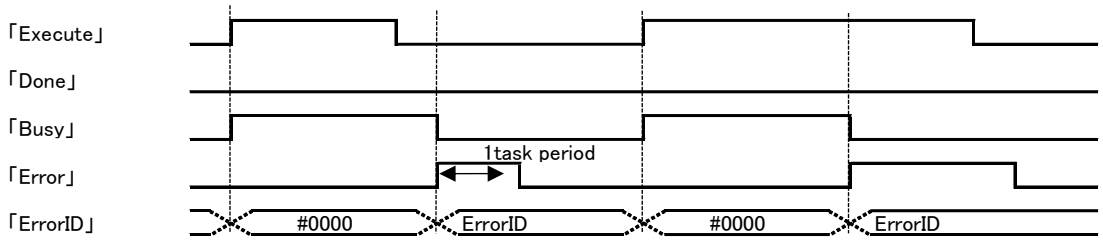
- At the same time as the rising edge of "Execute" (startup), "Busy" (running) becomes True.
- When the answer reception from thecamera is successful, "Done" (complete) is True.
- If an error occurs while this FB is running, "Error" (error) will be True and "Busy" (running) will be False. By referring to the value output to "ErrorID" (error code), you can know the reason of the error.

See chapter 5.7 Troubleshooting for values and meanings.5.7

- If "Execute" (start) is False prior to completion of executing this FB, only one task cycle is True for "Done" (complete) and "Error" (error).
- If "Execute" (start) is still True after this FB is executed, Done (complete) and output (error) are retained.
- Timing chart at normal completion



- Timing chart for abnormal completion



5.7 Troubleshooting the Sample Program

The function block UpdateCameraTimeFB, PrePostTriggerRecordingFB, TriggeredIntervalRecordingFB used in the sample program are the same, and the error status is represented by the error code shown in the table below. When an error occurs, take corrective action according to the error code.

Error code	Status	Description	Remedy
16#0000	Normal completion	-	-
16#2009	Failed certification	Camera certification failed.	Check that the unit is compatible with Digest certification. Check that the value of the variable of the set user name and password matches the user name and password set in the camera.
16#2010	User name/password character count and port No setting error	Out of set value range	Check the number of characters of the set IP address, username and password. IP: 7 to 15 characters User name: 4 to 14 characters Password: 4 to 64 characters Check the virtual input port number. No:1 to 32
16#2003	Socket status error	The state when the socket service instruction is executed is not appropriate.	Refer to "NJ/NX Series Command Reference Manual (SBCA-360)" and "NJ/NX Series CPU Unit Built-in EtherNet/IP ™ Port User's Manual (SBCD-359)" for troubleshooting.
16#2006	Socket Time Out	Socket service instruction timeout occurred.	
16#2007	Invalid socket handle	The handle specified in the socket service instruction is invalid.	
16#2008	Socket communication resource over	The instruction was executed beyond the resource of the socket service instruction that can be executed simultaneously.	

6 Reference: Camera Settings Screen

This section describes the specific setting procedures for the following cameras. Note that the screens are based on a combination of specific cameras and versions, and Omron does not guarantee that the same screens will be displayed on all cameras.

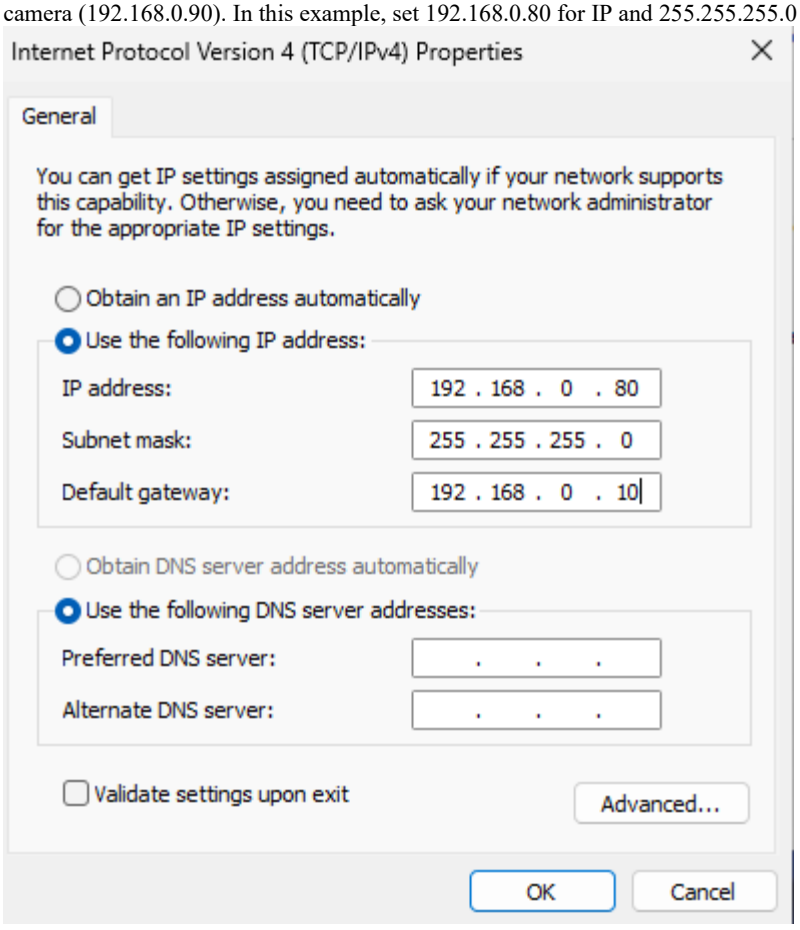
Type	OS Version	REFERENCE
M3085-V	11.4.63	6.1
M5525-E PTZ	8.40.8	6.2

6.1 OS version 11.4.63(M3085-V)

6.1.1 First-time set

Use Web Browser to set up thecamera. The first time you launch the camera, you need to configure networking settings, such as IP addressing. After setting, the camera can be accessed only by entering the user name and password.

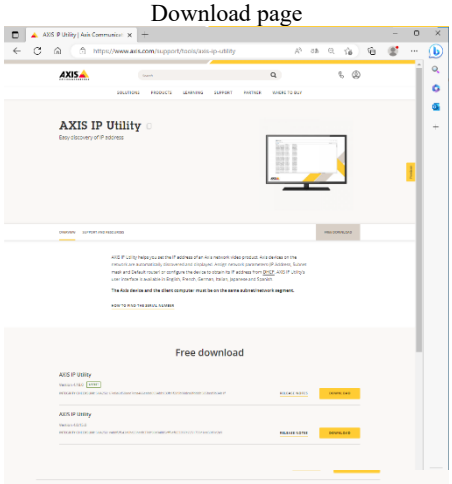
1. Set the computer's IP address to the same network address as the default IP address of the connected camera (192.168.0.90). In this example, set 192.168.0.80 for IP and 255.255.255.0 for the subnet mask.



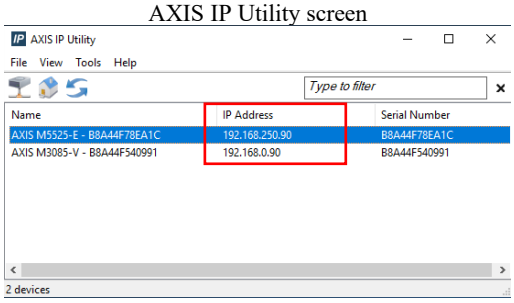
<Reference>
IP addresses of Axis cameras can be checked using AXIS IP Utility.
AXIS IP Utility can be downloaded from below.

www. axis.com/

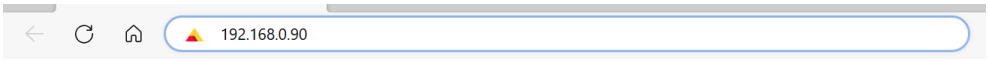
Download page



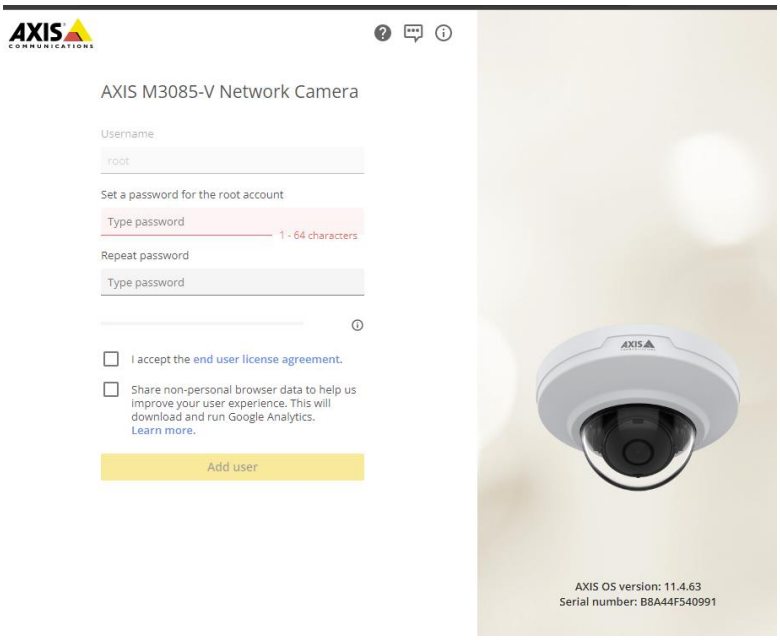
AXIS IP Utility screen



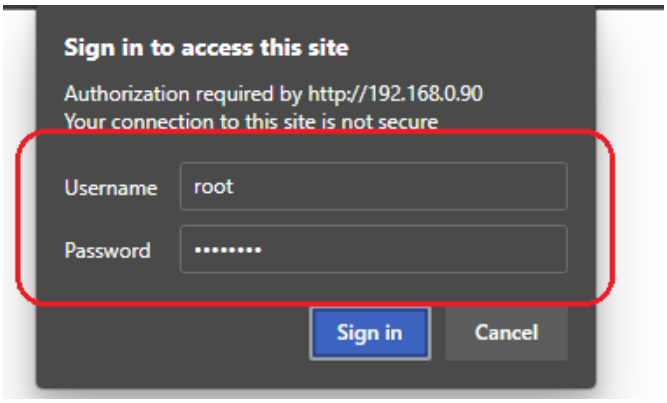
2. Enter the camera's IP in the browser.



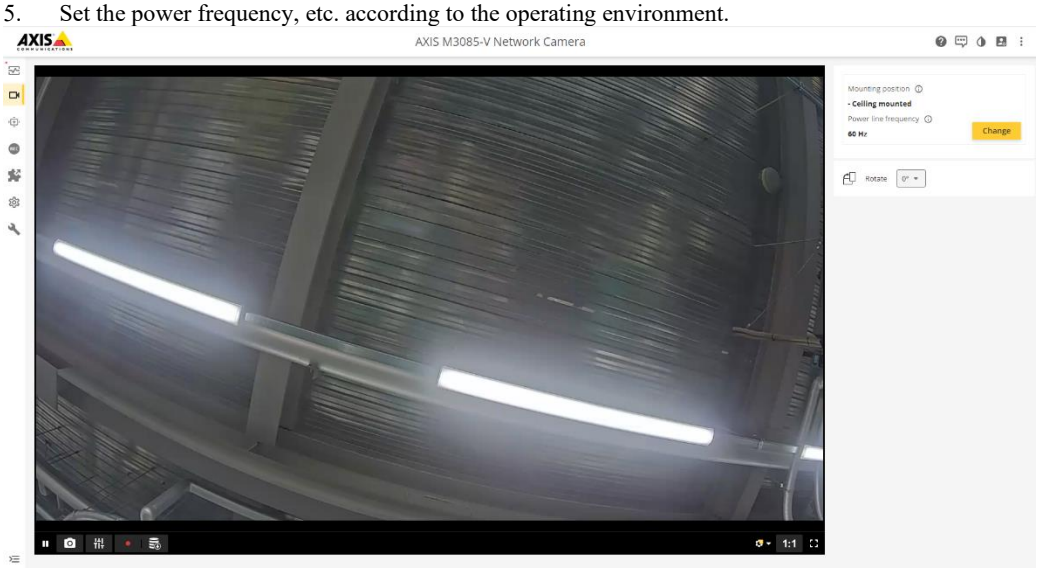
3. Enter the password to be set, and click [Add User].



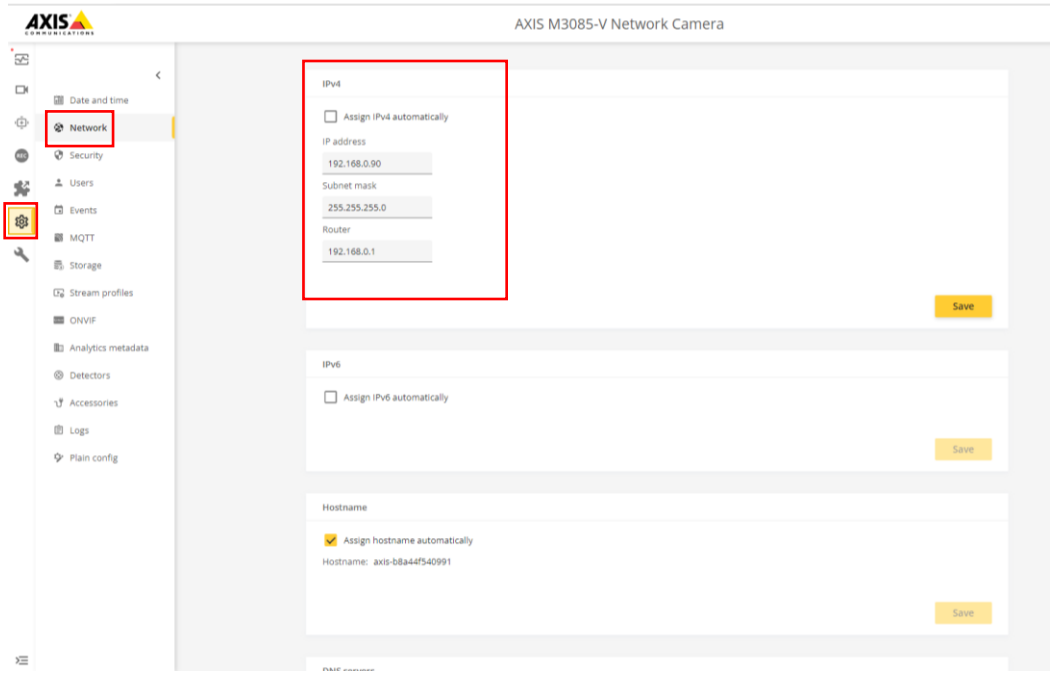
4. Enter the user name and password, and log in to the camera.



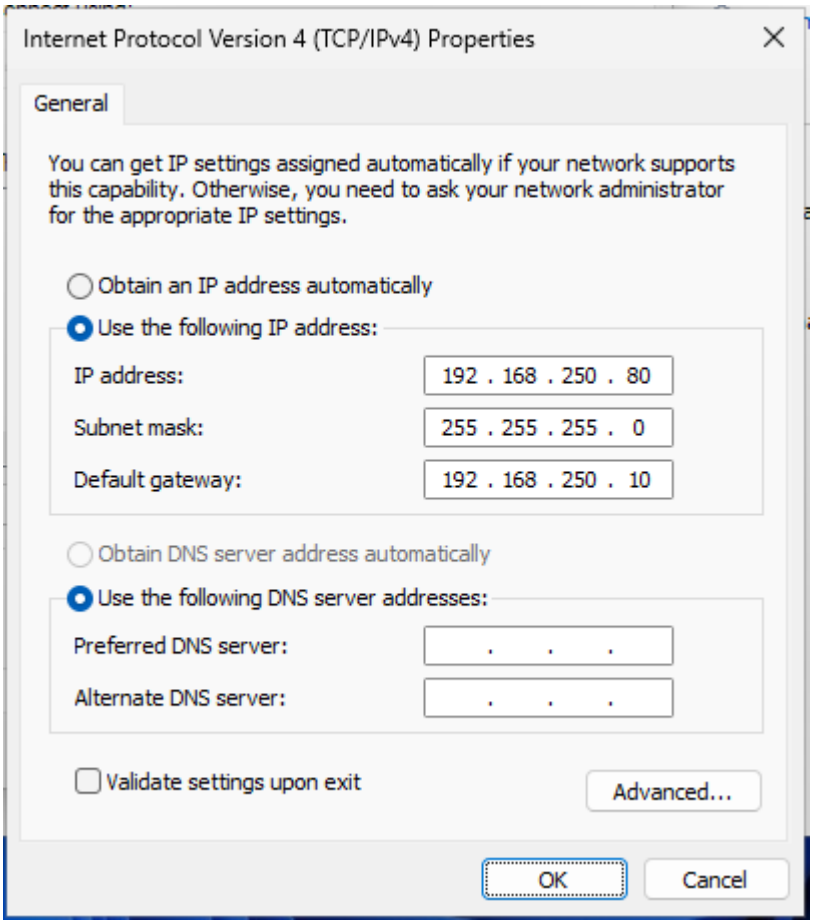
5. Set the power frequency, etc. according to the operating environment.



6. Select [System]-[Network] in the left pane of the screen to open the network setting screen. Clear the [Assign IPv4 automatically] checkbox in [IPv4] and set [IP address] and [Subnet mask]. IP address and subnet mask must be the same network address as the controller and network storage.



7. If the network settings on the camera disconnect the camera, reconfigure the computer's IP address so that it belongs to the same network address as the camera.

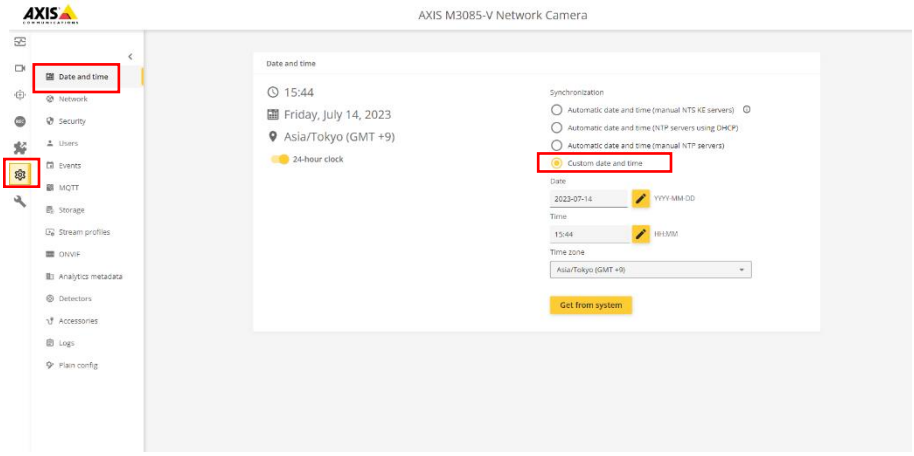


8. Enter the camera's IP address in the Browser, and then access it again to open the Live View screen. Adjust the camera setting position while checking the image, and then click the [Complete] button.

6.1.2 Setting time synchronization

To use the sample program UpdateCameraTime to align the camera time with the controller time, Synchronization settings on the camera shall be disabled. Also, the time zone of the camera matches the time zone set in the controller.

1. Click the [System] and [Date and time] buttons, and select [Custom date and time].
   Also, the time zone of the camera matches the time zone set in the controller.



6.1.3 Setting Recording Rules

Recording instructions from the controllers are achieved by controlling ON/OFF of the virtual entry (Virtual Input) of the camera.

Axis cameras allow you to set recording rules that correspond to the status of the virtual entry.

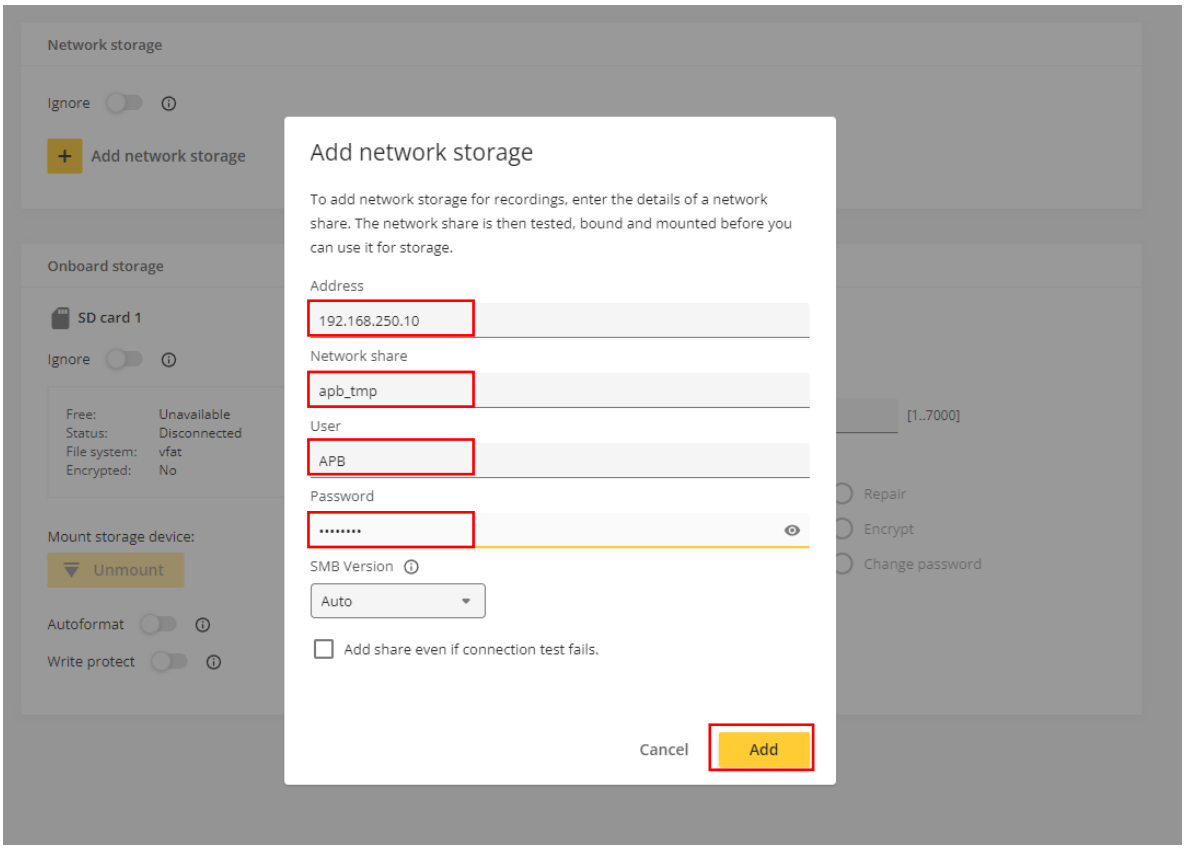
This section describes the following procedure for setting the camera's recording rule for virtual input.

- Location to save the movie file
- Video profile
- Recording Rules for Virtual Input

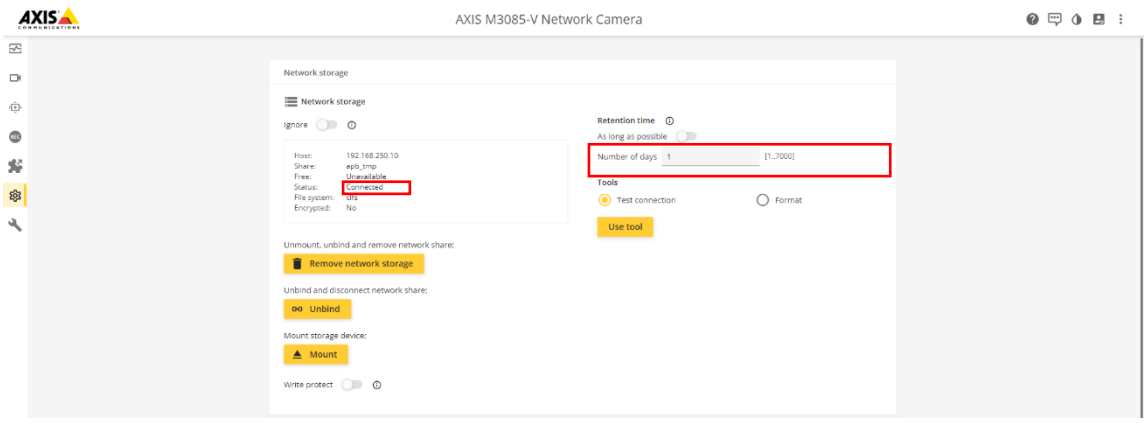
■Save destination setting of movie file

Specify the destination for saving video files.

1. Select [System]-[Storage], and click the [Add Network Storage] button.
   In addition, enter IP address of the network storage in [Address], the shared folder name of the storage destination in [Network share], enter the login ID, password of the network storage in [User] and [Password], and click the [Add] button.



2. When the connection is completed, the status changes to [Connected]. Then set the storage period of the video file. Specify the period of time for saving video files in the [Number of days] field.

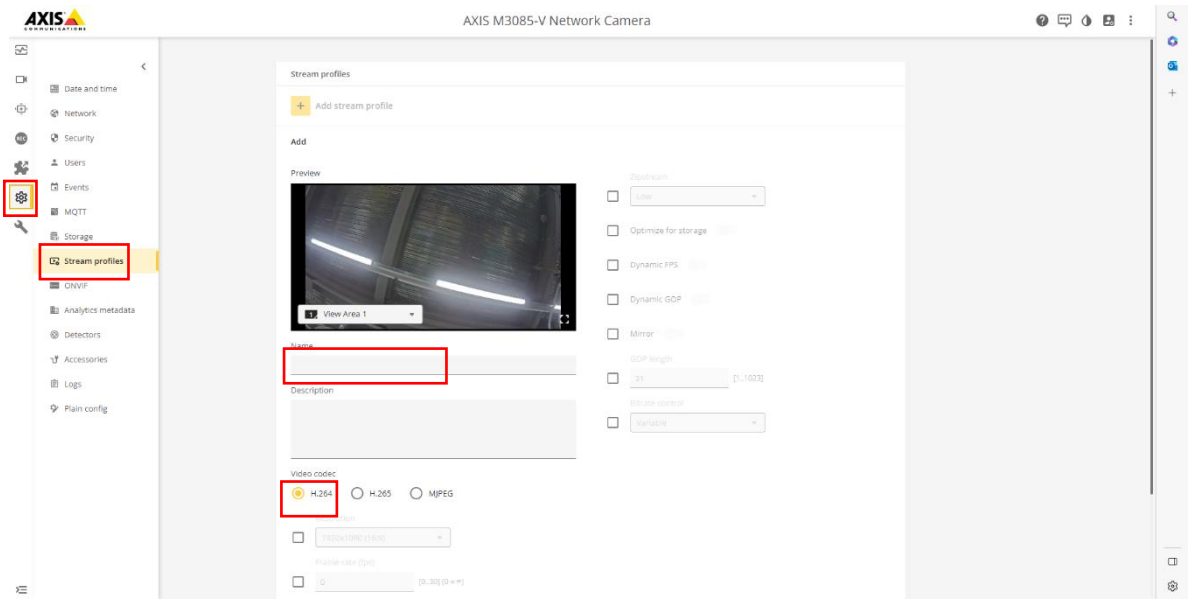


■Video Profile Settings

Set the profile of the video to be recorded. You can set multiple profiles with any name.

Specify the profile that you configured when you configured the recording rule.

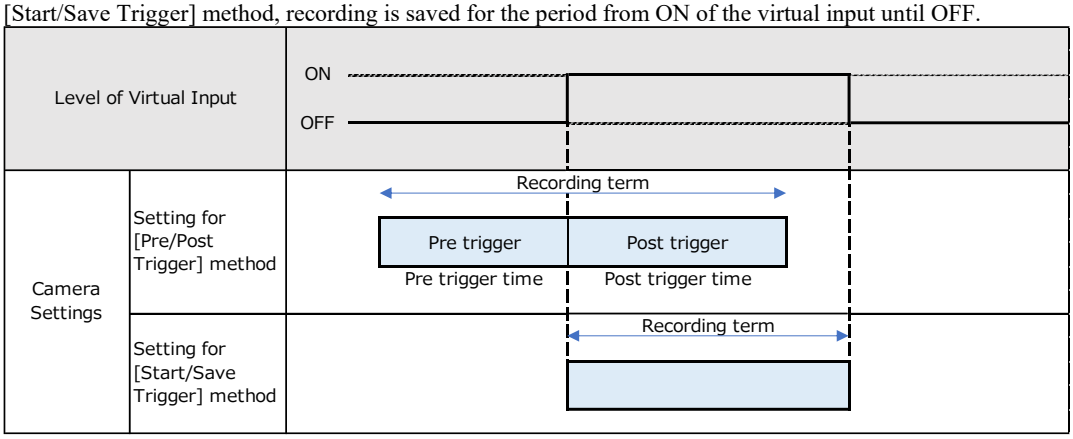
1. In the live view screen, select [Settings]-[System]-[Stream Profile], select H.264 in the video codec, enter the name in [Name], and click [Save].



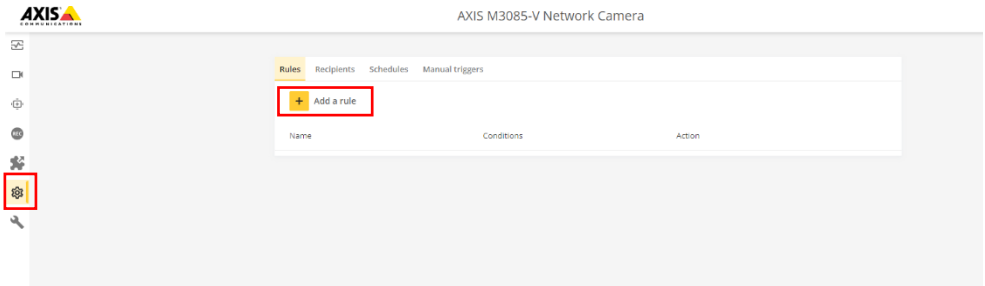
■Configuring Recording Rules for Virtual Input

The following describes the settings for recording at the timing that corresponds to the variable log output setting [Pre/Post Trigger] method and the [Start/Save Trigger] method of the automation playback function.

Note that in the [Pre/Post Trigger] input, recording is saved for a period prior to the [Pre trigger time] time and after the [Post trigger time] time, starting from the rising edge of ON. With the settings corresponding to the [Start/Save Trigger] method, recording is saved for the period from ON of the virtual input until OFF.



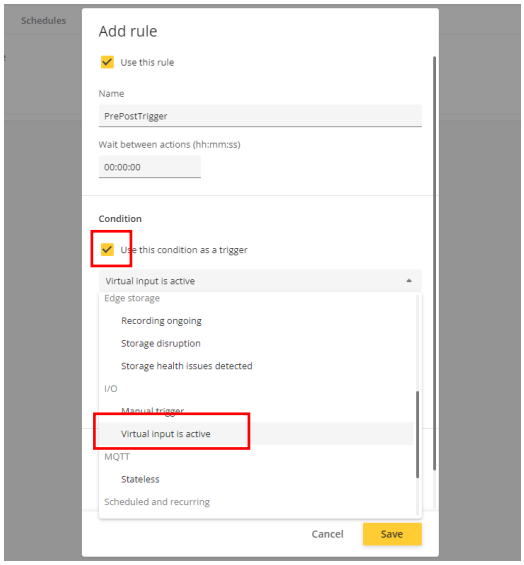
1. Select [Settings]-[System]-[Events], and then click [Add Rule].



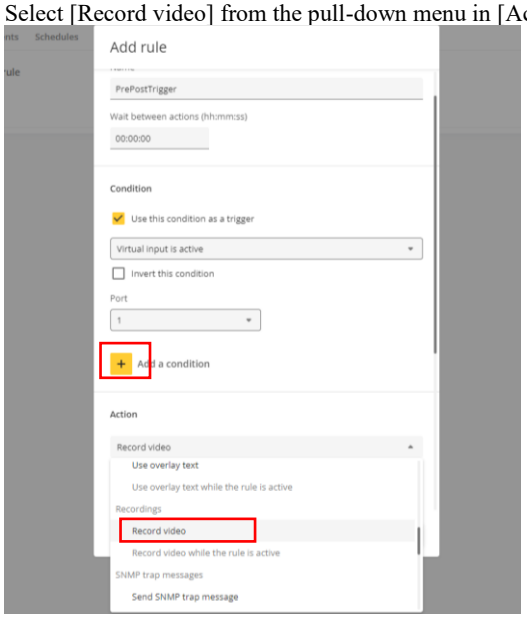
2. Set as shown below according to the variable log output setting of Automation Playback.

Setting corresponding to Pre/Post trigger type

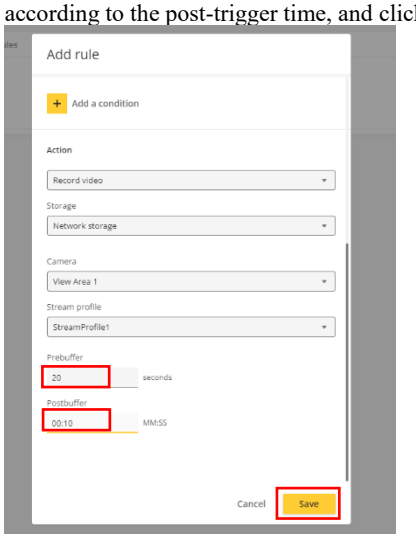
Select [Virtual input is active] from the pull-down menu, and select the [Use this condition as trigger] check box.



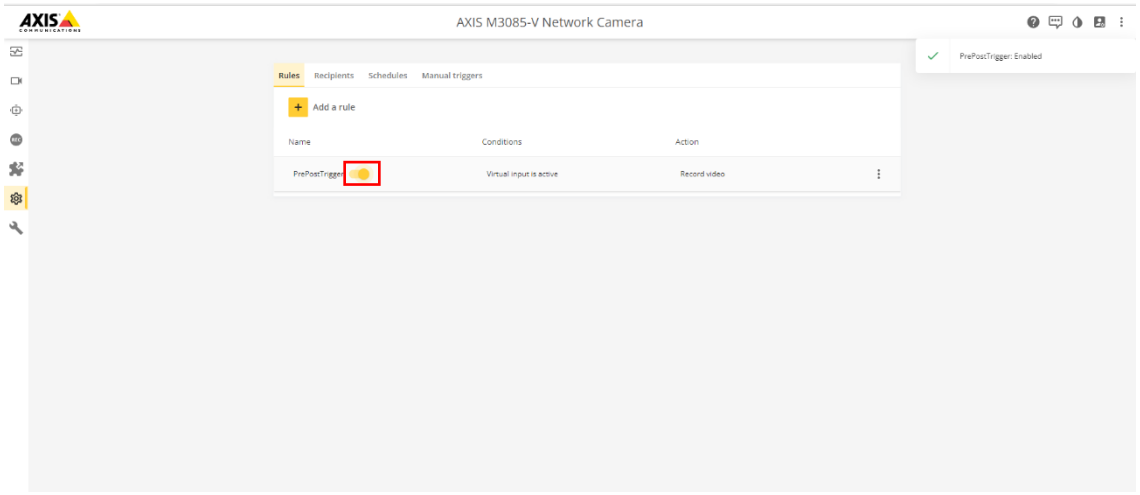
Select [Record video] from the pull-down menu in [Action].



Set the [Prebuffer] time according to the pre-trigger time of the variable log output setting and the [Postbuffer] according to the post-trigger time, and click [Save].

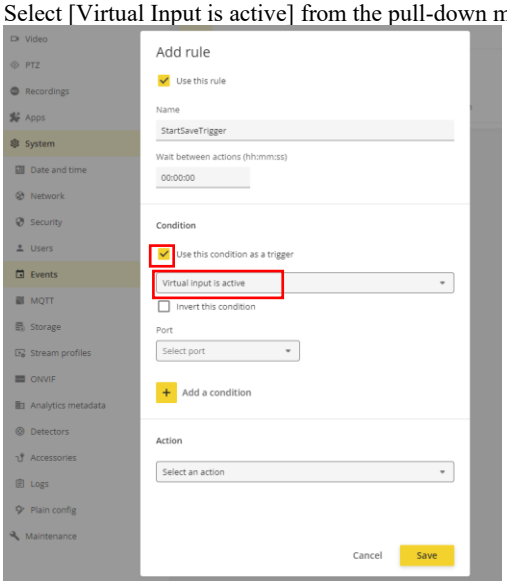


Click the button next to the name to activate the rule.

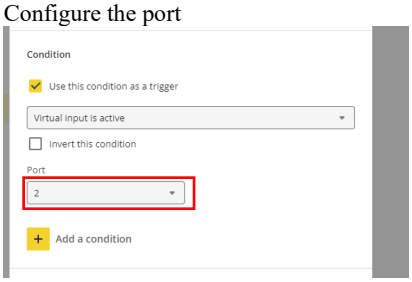


Sets corresponding to Start/Save trigger method

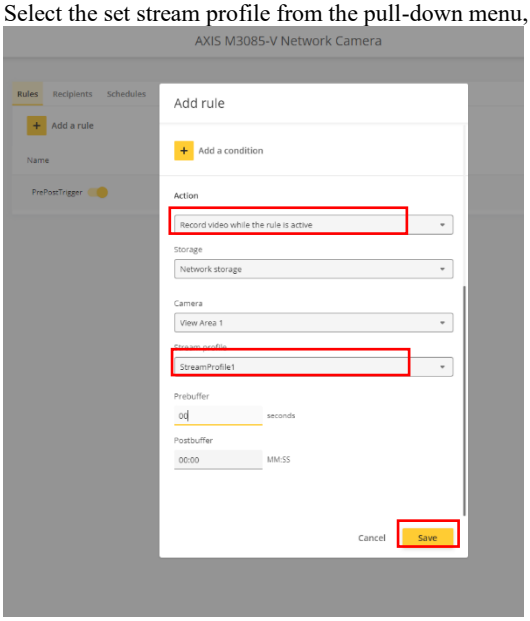
Select [Virtual Input is active] from the pull-down menu and set [Use this condition as a trigger] check box.



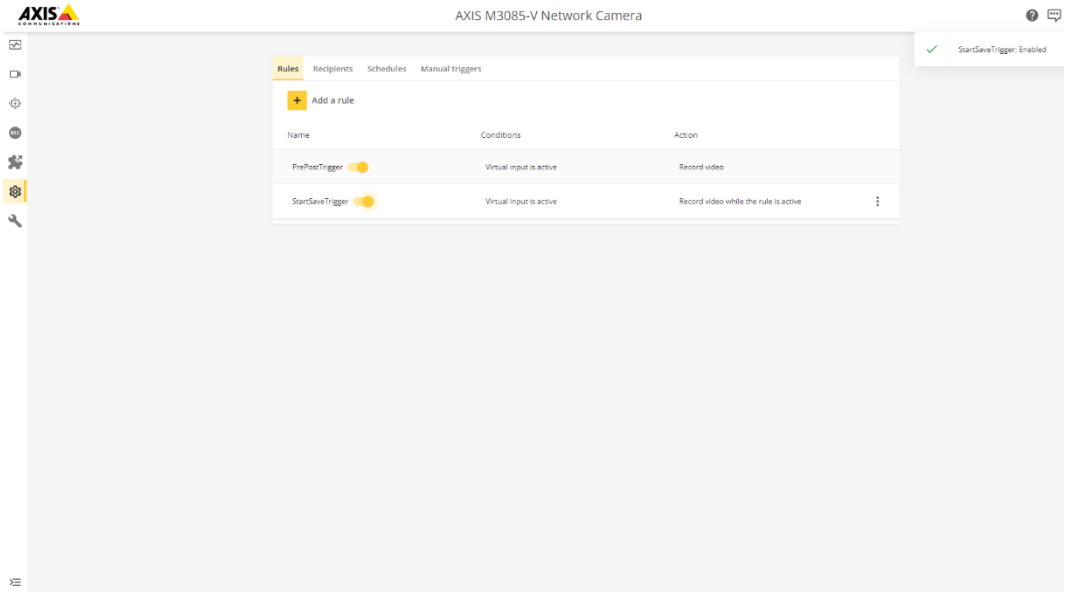
Configure the port



Select [Record video while the rule is active] from the pull-down menu in [Action] section.
Select the set stream profile from the pull-down menu, and click [Save].



Click the button next to the name to activate the rule.



6.1.4 Restarting the camera and checking the settings

Restart the camera power. After completing the restart, check that the settings of the camera you have set are saved correctly.

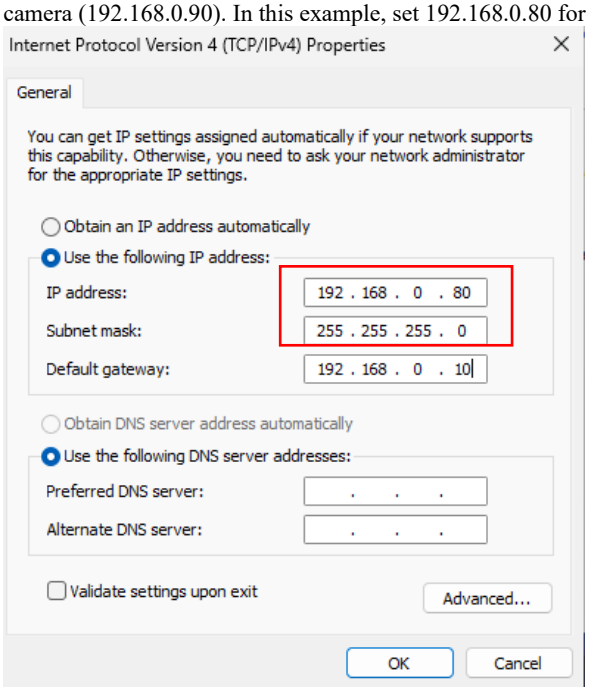
- Setting time synchronization
- Configuring your Time Zone
- Setting Recording Rules

6.2 OS version 8.40.8(M5525-E PTZ)

6.2.1 First-time set

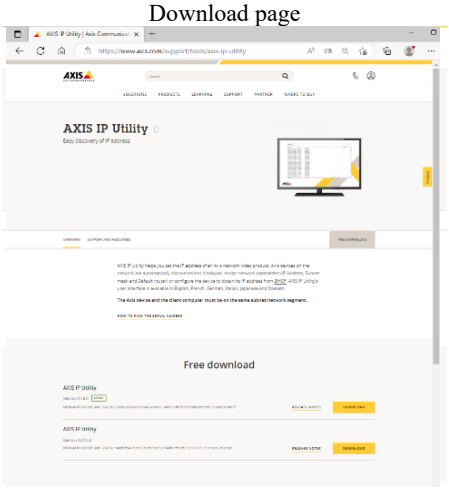
Use Web Browser to set up thecamera. The first time you launch the camera, you need to configure networking settings, such as IP addressing. After setting, the camera can be accessed only by entering the user name and password.

1. Set the computer's IP address to the same network address as the default IP address of the connected camera (192.168.0.90). In this example, set 192.168.0.80 for IP and 255.255.255.0 for the subnet mask.

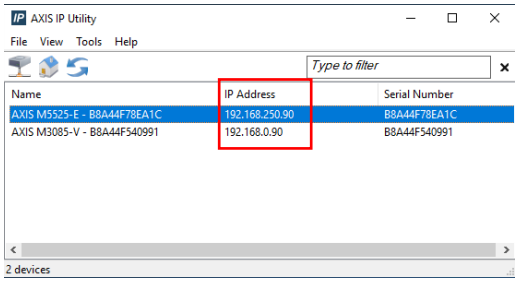


<Reference>
IP addresses of Axis cameras can be checked using AXIS IP Utility.
AXIS IP Utility can be downloaded from below.
www.axis.com/

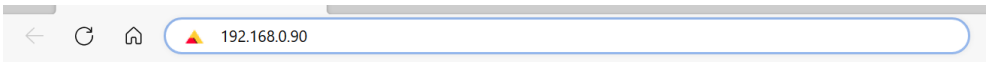
Download page



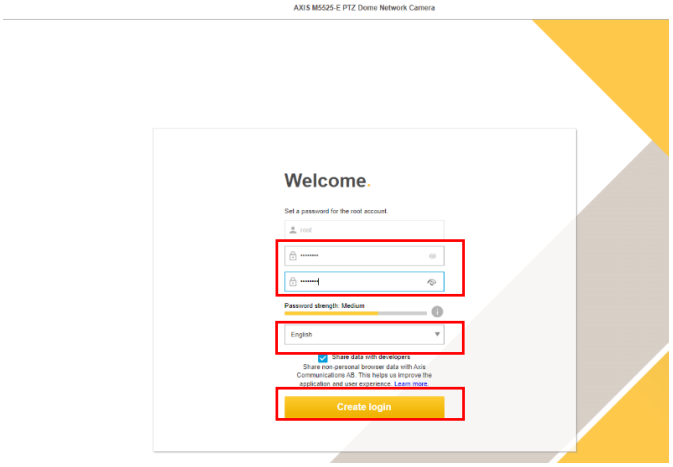
AXIS IP Utility screen



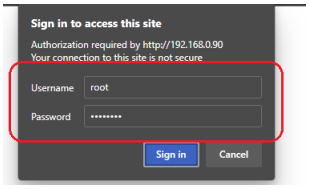
2. Enter the camera's IP in the browser.



3. The [Welcome] screen is displayed. Enter the password for the “root” account to be set, select the language to be used, and click the [Create login] button.

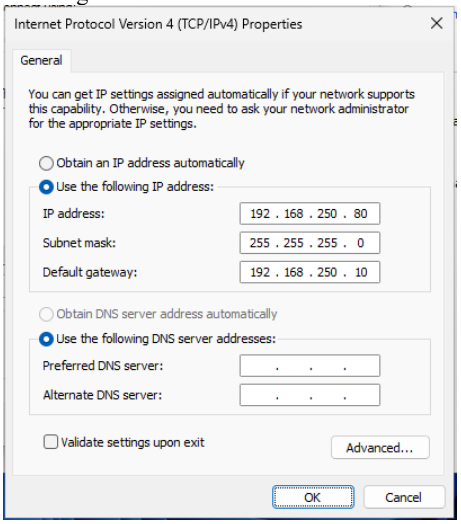


4. Enter the user name and the set password, and log in to the camera.



5. Set [IPv4] to [Manual IP and Manual DNS]. [IP address] and [Subnet mask] must be the same network address as the controller and network storage.
In addition, turn OFF [Automatic date and time] of [Date and time], set the [Use 24-hour format] checkbox to ON, and set [Time zone] to the same time zone as the controller setting.

6. If the network settings on the camera disconnect the camera, reconfigure the computer's IP address so that it belongs to the same network address as the camera.

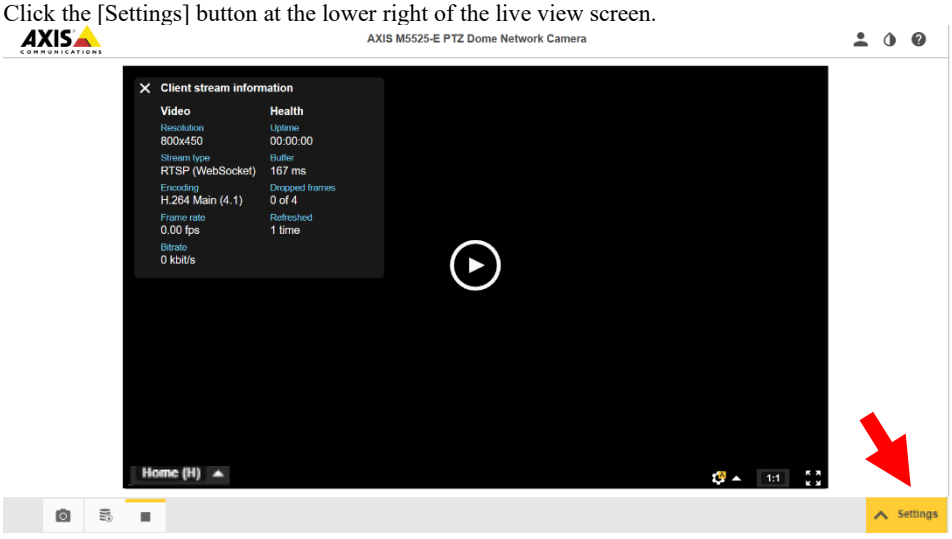


7. Enter the camera's IP address in the Browser, and then access it again to open the Live View screen. Adjust the camera setting position while checking the image, and then click the [Complete] button.

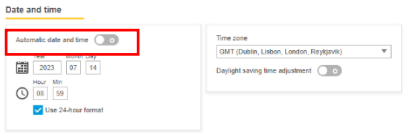
6.2.2 Setting time synchronization

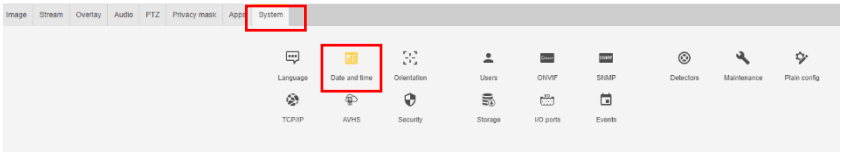
To use the sample program UpdateCameraTime to align the camera time with the controller time, turn OFF the camera's Date and Time Synchronization settings. Also, the time zone of the camera matches the time zone set in the controller.

1. Click the [Settings] button at the lower right of the live view screen.



2. Select [Systems] > [Date and time] to turn OFF the [Automatic date and time] setting.
Also, the time zone of the camera matches the time zone set in the controller.





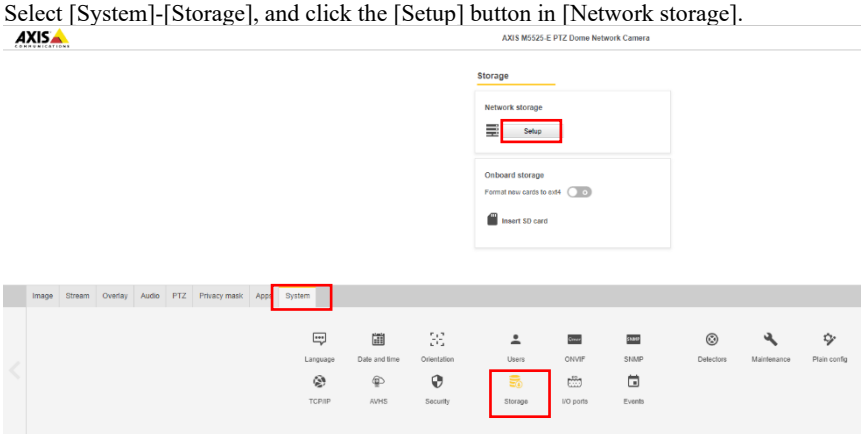
6.2.3 Setting Recording Rules

Recording instructions from the controllers are achieved by controlling ON/OFF of the virtual entry (Virtual Input) of the camera.
Axis cameras allow you to set recording rules that correspond to the status of the virtual entry.
This section describes the following procedure for setting the camera's recording rule for virtual input.

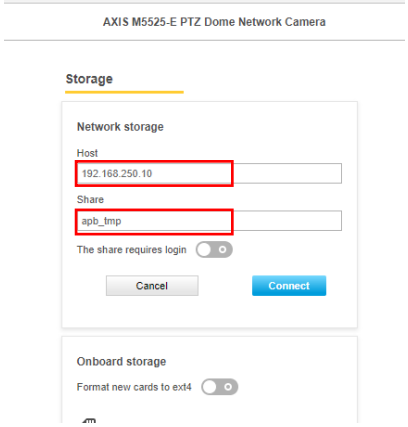
- Location to save the movie file
- Video profile
- Recording Rules for Virtual Input

■Save destination setting of movie file
Specify the destination for saving video files.

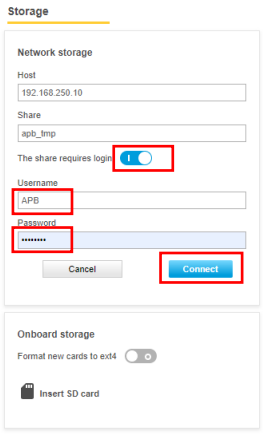
1. Select [System]-[Storage], and click the [Setup] button in [Network storage].



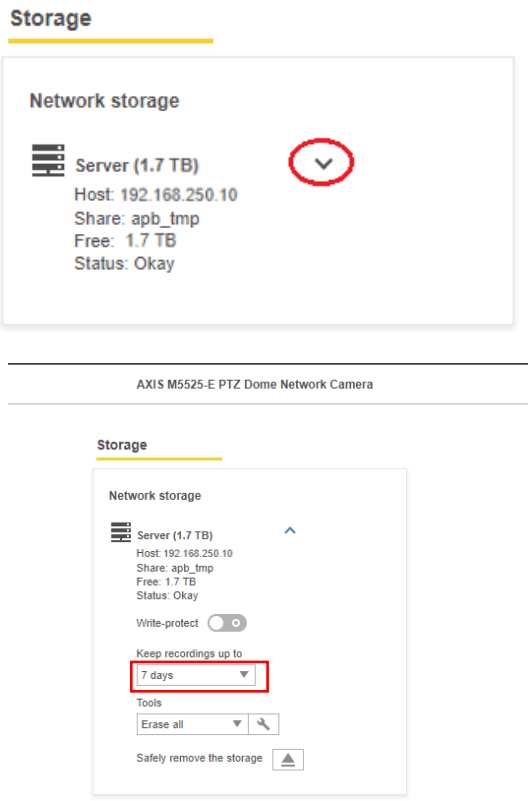
2. Enter IP of the networked storage in the [Host] field and the shared folder name in the [Share] field.



3. Check [The share requires login], enter the login ID and password of the network storage in [Username] and [Password], and then click the [Connect] button.



4. When the connection is completed, the status changes to [Okay]. Next, click [v] on the server, and set the storage period of the video to be recorded in the [Keep recording up to] menu.

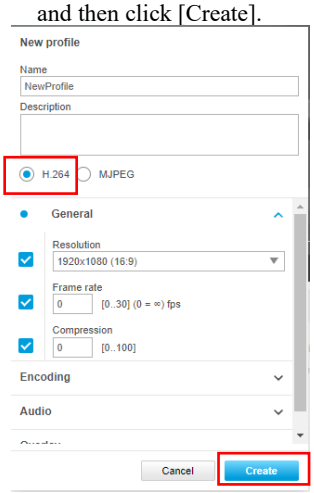


■Video Profile Settings

Set the profile of the video to be recorded. You can set multiple profiles with any name.
Specify the profile that you configured when you configured the recording rule.

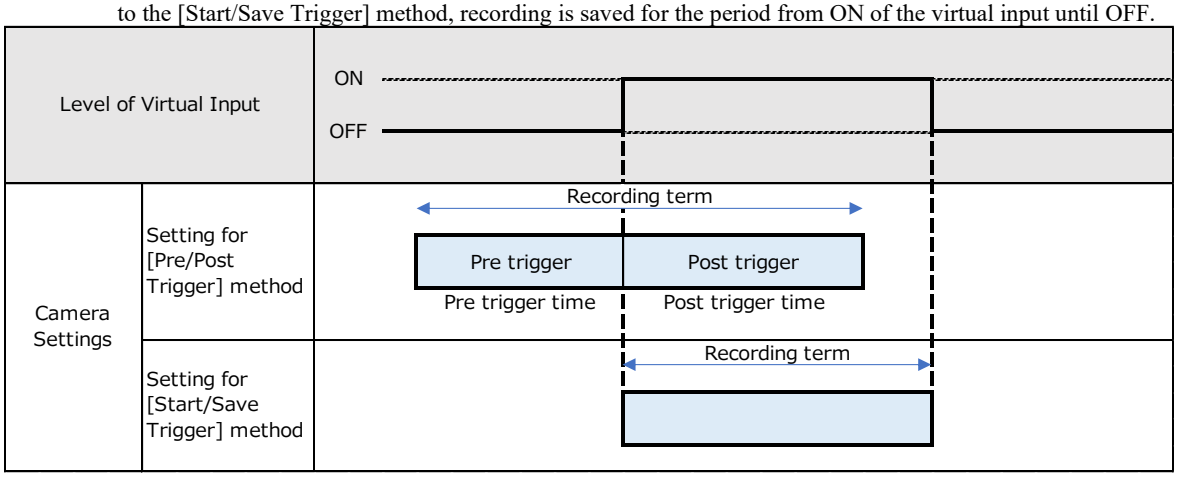
1. In the live view screen, select [Settings]-[Stream]-[Stream profiles].
2. Click [Create new] in the [Stream profiles] screen.

3. Enter the desired name in the profile, select [H.264] as the video format, set the resolution and other items, and then click [Create].

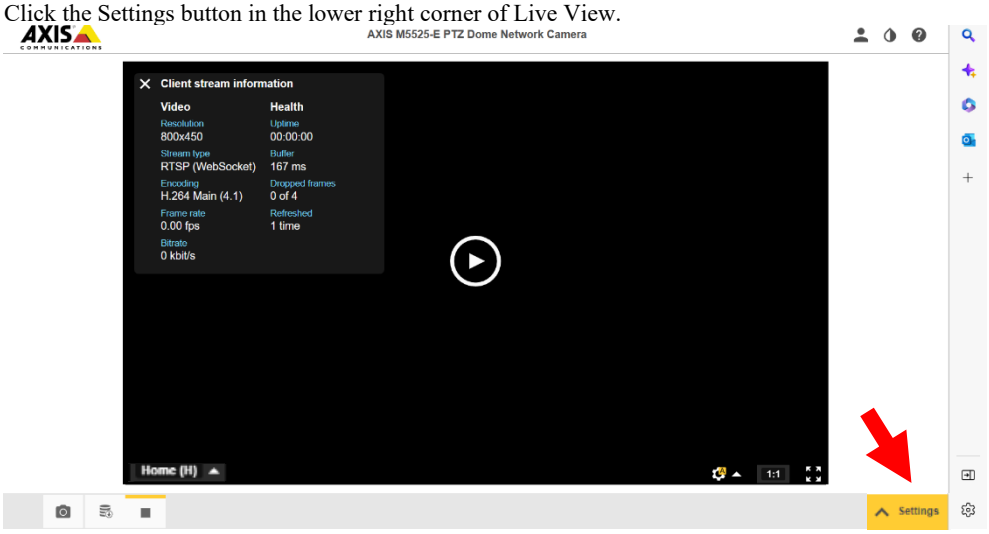


■Configuring Recording Rules for Virtual Input

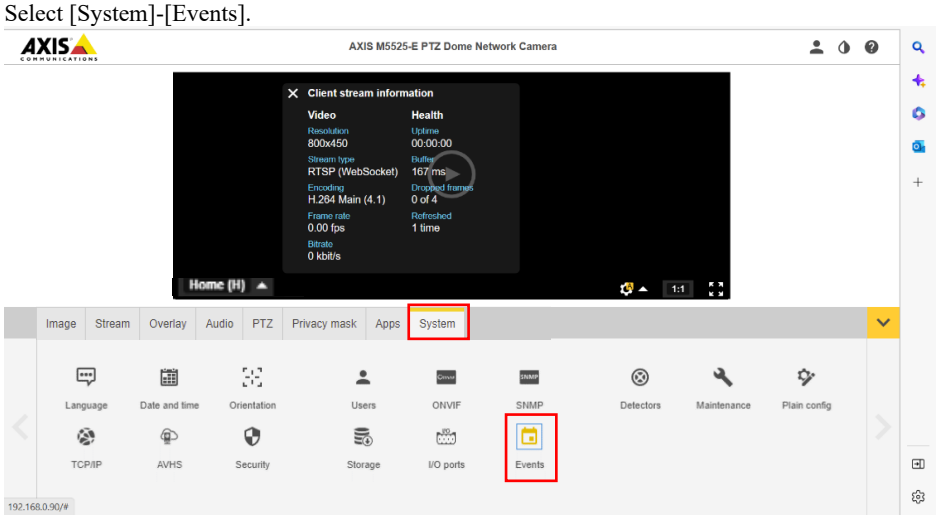
The following describes the settings for recording at the timing that corresponds to the variable log output setting [Before and After Trigger] method and the [Start/Save Trigger] method of the automation playback function. Note that in the [Before and After Trigger] input, recording is saved for a period prior to the [Pre trigger time] time and after the [Post trigger time] time, starting from the rising edge of ON. With the settings corresponding to the [Start/Save Trigger] method, recording is saved for the period from ON of the virtual input until OFF.



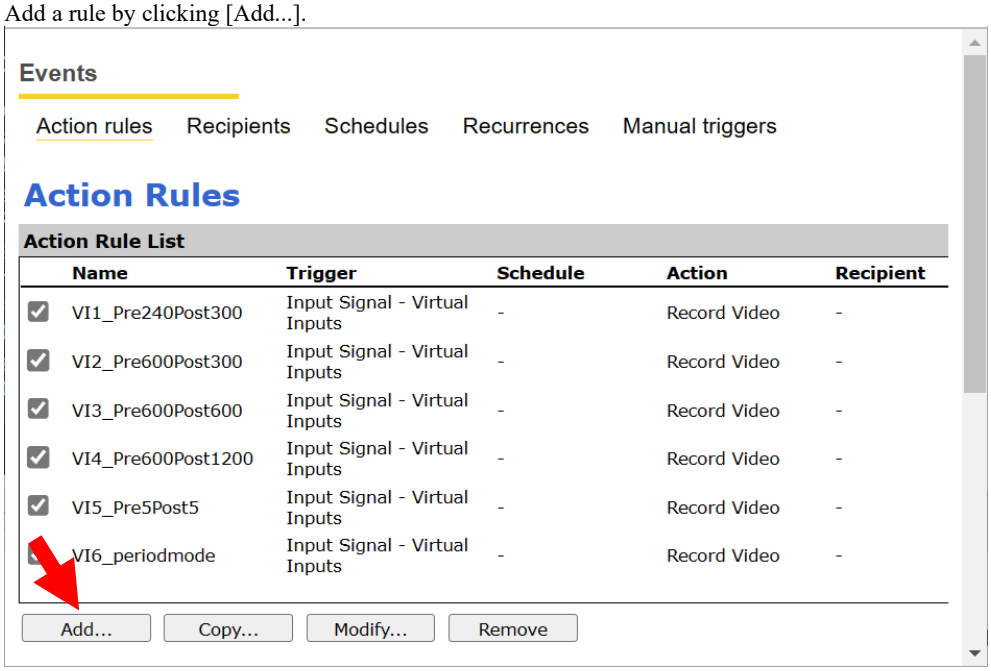
1. Click the Settings button in the lower right corner of Live View.



2. Select [Stream]-[Stream Profile].
3. From the stream profile screen, click [New].
4. Enter an arbitrary name for the profile.
5. Set each item such as resolution, and click [Create].
6. Select [System]-[Events].

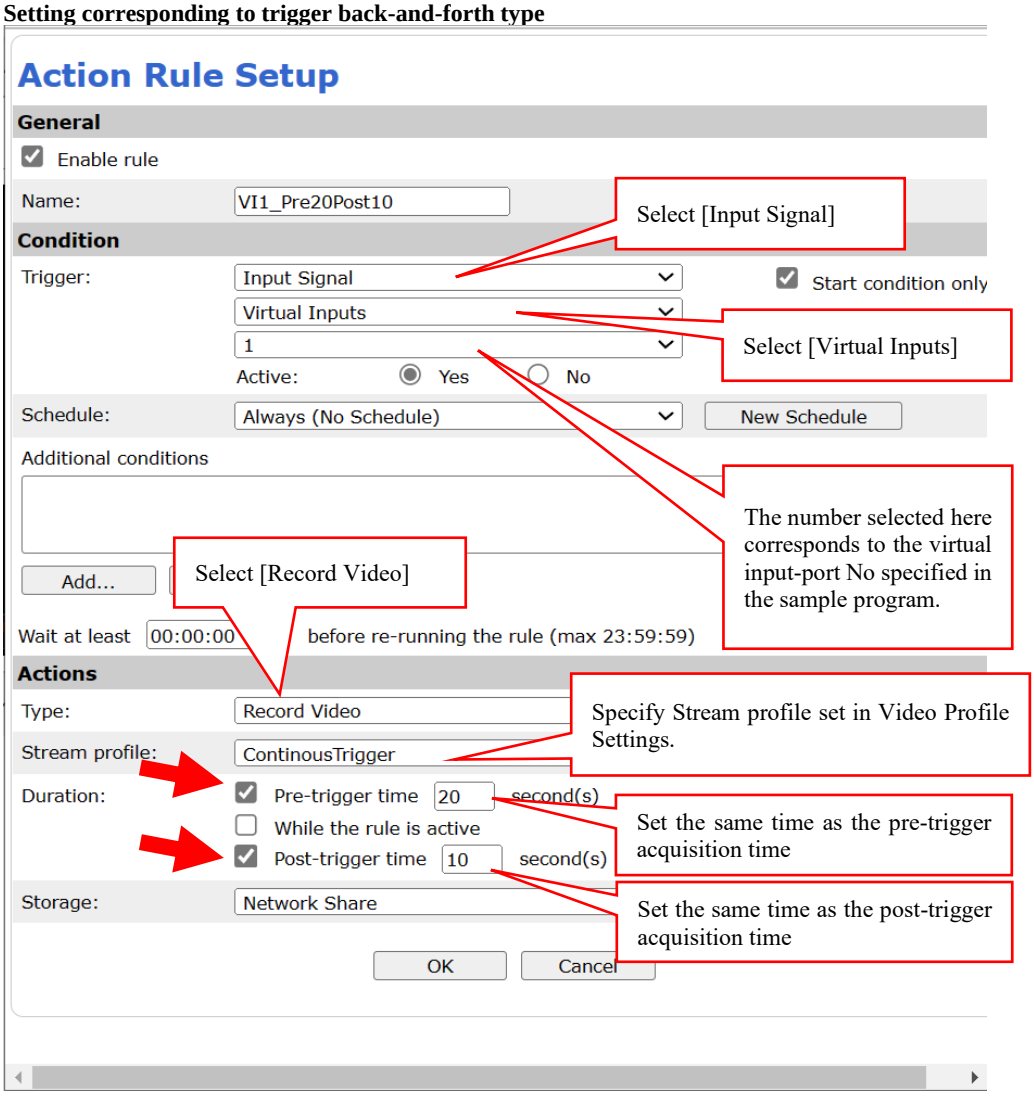


7. Add a rule by clicking [Add...].

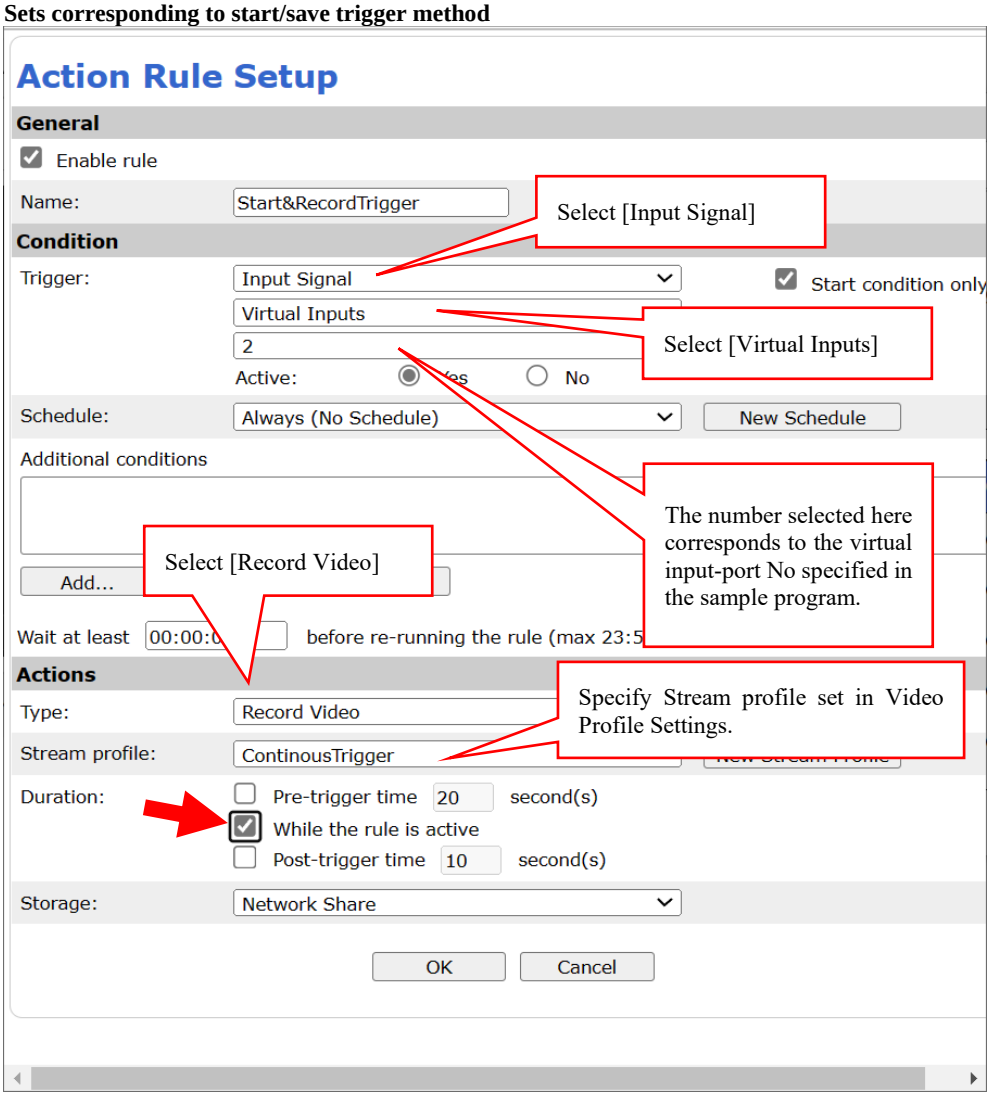


8. Set as shown below according to the variable log output setting of Automation Playback.

Setting corresponding to trigger back-and-forth type



Sets corresponding to start/save trigger method



6.2.4 Restarting the camera and checking the settings

Restart the camera power. After completing the restart, check that the settings of the camera you have set are saved correctly.

- Setting time synchronization
- Configuring your Time Zone
- Setting Recording Rules

7 Reference: Communication between the camera and controller

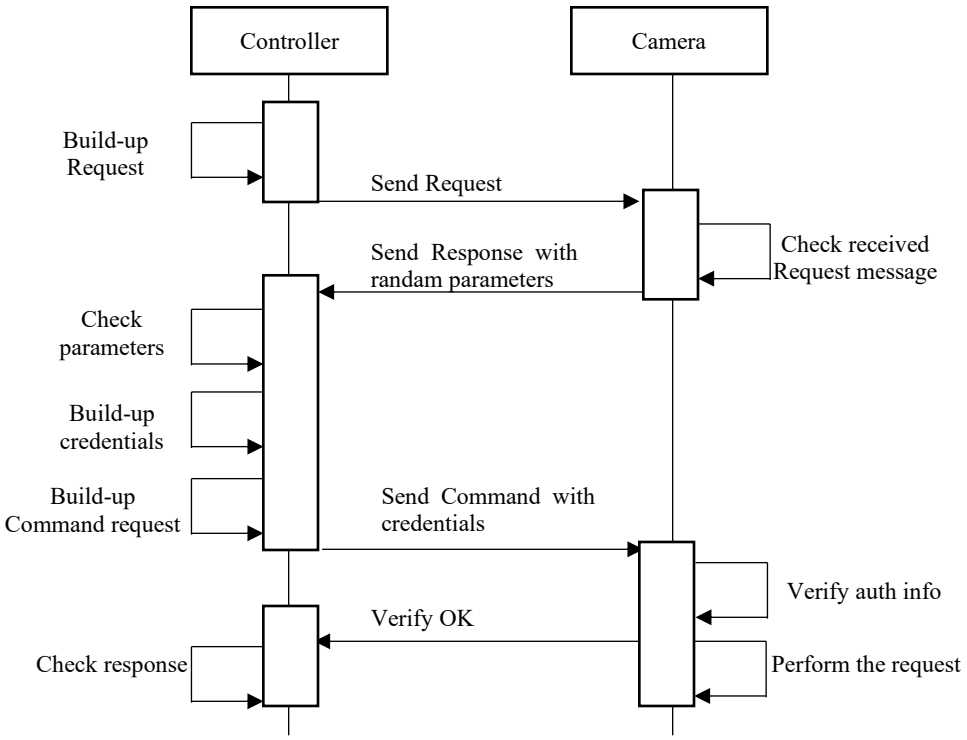
7.1 About Digest Certification

The communication between the camera and controller in this example program assumes Digest certification. In this example program, the camera is controlled by performing Digest certification according to the following

steps and sending commands to the camera.

This sample program performs Digest certification as follows.

1. Sends a request from the controller to the camera.
2. The camera responds to the information required for authentication.
3. The controller receives a response and generates authentication information for the camera based on the received information and information such as the user name and password.
4. Send the credentials and request from the controller.
5. The camera verifies and performs the request. It then returns OK response to the controllers.



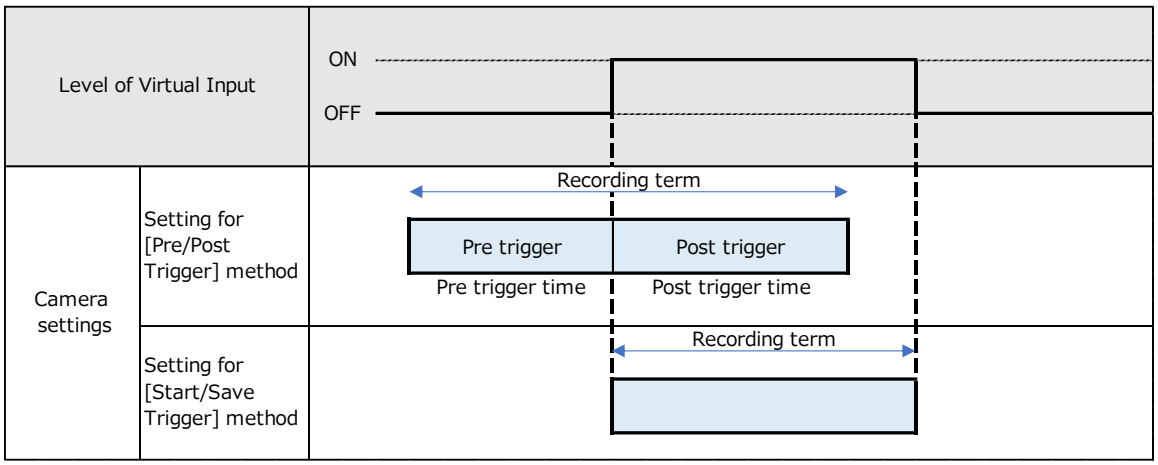
7.2 Using Vapix commands

In this example program, Vapix command below is used to control the camera.

Order	Vapix Commands
Virtual-input ON of the camera	Virtualinput/activate.cgi
Virtual-input OFF of the camera	Virtualinput/deactivate.cgi
Time update	Date.cgi、time.cgi

7.3 Virtual input

Virtual input has ON,OFF status for each virtual input port.
The operation of the camera based on ON,OFF of virtual input can be determined for each virtual input port from the event settings of the camera. (See 4.3 Setting Recording Rules.)4.3Setting Recording Rules
By utilizing the event settings of this camera, you can realize video saving compatible with the "before and after trigger" method and the "start and save trigger" method as shown in the figure below.


Level of Virtual Input
ON
OFF
Camera settings
Setting for [Pre/Post Trigger] method
Recording term
Pre trigger
Post trigger
Pre trigger time
Post trigger time
Setting for [Start/Save Trigger] method
Recording term