

POVCAM Interface Specifications

Video Transmission / Clip Operation

Target Models

AG-UCK20, AG-UMR20

AG-MDC20, AG-MDR25

Version 1.0

Panasonic Corporation

Change History

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1. Introduction

This document describes the specifications for video transmission and clip operation when operating a memory card portable recorder and special optional compact camera head via the network. For details on general operation, see the instruction manual.

There is some compatibility with HD integrated cameras in terms of the command system.

The memory card portable recorder and special optional compact camera head may be referred to as simply "camera" in some sequence diagrams and explanations.

Panasonic shall not take any responsibility for damages caused as a result of the use of this information. This information may be changed without prior notice due to the upgrade of the product version in the future. The usage examples are only reference examples for this series. Support cannot be offered for each program. Moreover, some information of the communication between the camera and browser is not disclosed.

About the access levels

In this document, "Live" and "Admin" are defined as the access levels. The necessity of the ID/password during CGI execution is changed from the User auth. menu of the memory card portable recorder and special optional compact camera head.

When User auth. is OFF (factory setting):

Live (Video acquisition and camera control):	Authentication not necessary
Admin (Various SETUP controls):	ID/password for Administrator authority are necessary

When User auth. is ON:

Live (Video acquisition and camera control):	ID/password for camera control or Administrator authority are necessary
Admin (Various SETUP controls):	ID/password for Administrator authority are necessary

About the priority mode

The types of CGI that can be executed and the range of parameter values differ depending on the priority mode of the memory card portable recorder and special optional compact camera head.

For details, see the instruction manual.

Example) When the priority mode (/cgi-bin/set_priority_mode, /cgi-bin/get_priority_mode) is REC/PB priority

=> Control cannot be performed for H.264 (2).

2. CGI List for Video Transmission

2.1. Transmission User Management

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Transmission user management	/cgi-bin/getuid	FILE	2	2 (Fixed)
		vcodec	jpeg h264 h264_2	jpeg: During JPEG transmission h264: During H.264(1) transmission h264_2: During H.264(2) transmission
		reply	browser info	Command response format specification (can be omitted) browser: for the camera browser info: for the application

Usage example) Acquisition of user ID (during H264(1) transmission)

<http://192.168.0.10/cgi-bin/getuid?FILE=2&vcodec=h264>

* When the transmission mode specified with the vcodec parameter cannot be used, 204 No Content is issued as the response.

The description of the response data is as shown below.

Item	Value of response	Description
UID	Numeric value	User ID
ImageFormat	jpeg, h264, h264_X	During JPEG transmission During H.264(1) transmission During H.264(X) transmission
ImageCaptureMode	2m	Fixed value
ratio	16_9	Fixed value
Maxfps	30, 60	Max. frame rate
StreamMode	1	Fixed value
iBitrate	Numeric value	Bit rate setting of H.264
iResolution	640,1280,1920,3840	Horizontal resolution setting of H.264
iQuality	fine, low	Image quality setting of H.264
sDelivery	uni, multi, uni_manual	uni: unicast(auto) multi: multicast uni_manual: unicast(manual)
iUniPort	1024 to 50000	Unicast port number (image)
iMultiAdd1	224 to 239	First octet of multicast address
iMultiAdd2	0 to 255	Second octet of multicast address

Item	Value of response	Description
iMultiAdd3	0 to 255	Third octet of multicast address
iMultiAdd4	0 to 255	Fourth octet of multicast address
iMultiAdd	(IP address)	H.264 multicast address
iMultiPort	Numeric value	Multicast port number
aEnable	off, in	off: Audio OFF in: Audio ON (reception)
aEnc	2	Fixed value (2: AAC)
aBitrate	128,96,64	Bit rate setting of audio
aBitrate2	64	Fixed value
aInterval	20	Fixed value
aInPort	1024 to 50000	Unicast port number (audio)
aOutInterval	640	Fixed value
aOutPort	34004	Fixed value
aOutStatus	off	Fixed value
aOutUID	0	Fixed value
ePort	31004	Fixed value
sAlarm	off	Fixed value
SDrec	disable	Fixed value
SDrec2	disable	Fixed value
sAUX	disable	Fixed value
iHttpPort	Numeric value	HTTP port number
iMultiAuto_h264	0	Fixed value
iMultiAuto_h264_2	0	Fixed value
sRtspMode_h264	0	Fixed value
sRtspMode_h264_2	0	Fixed value

2.2. Device Information Acquisition

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Device information acquisition	/cgi-bin/getinfo	FILE	1	1 (Fixed)

Usage example) Device information acquisition

<http://192.168.0.10/cgi-bin/getinfo?FILE=1>

The description of the response data is as shown below.

Item	Value of response	Description
MAC	XX-XX-XX-XX-XX-XX	MAC address
SERIAL	XXXXXXXXXX	Product serial number
VERSION		Software version
NAME	AG-XXXX	Product number
SDrec	disable	Fixed value
SDrec2	disable	Fixed value
sAlarm	off	Fixed value
sAUX	off	Fixed value
ePort	31004	Fixed value
aEnable	off, in	off: Audio OFF , in: Audio ON (reception)
aEnc	2	Fixed value (2: AAC)
aBitrate	128,96,64	Bit rate setting of audio
aBitrate2	64	Fixed value
aInterval	20	Fixed value
aOutInterval	640	Fixed value
aOutPort	34004	Fixed value
aOutStatus	off	Fixed value
aOutUID	0	Fixed value
alnPort_h264	1024 to 50000	H.264(1) Audio reception port number
alnPort_h264_2	1024 to 50000	H.264(2) Audio reception port number
sRtspMode_h264	0	Fixed value
sRtspMode_h264_2	0	Fixed value
ImageCaptureMode	2m	Fixed value
ratio	16_9	Fixed value
Maxfps	30, 60	Max. frame rate
StreamMode	1	Fixed value
iTransmit_h264	1	Fixed value

Item	Value of response	Description
sDelivery_h264	uni, multi, uni_manual	uni: Unicast (auto) multi: Multicast uni_manual Unicast (manual)
iBitrate_h264	Numeric value	Bit rate setting of H.264(1)
iResolution_h264	640,1280,1920,3840	Horizontal resolution setting of H.264(1)
iQuality_h264	fine, low	Image quality setting of H.264(1)
iMultiAuto_h264	0	Fixed value
iTransmit_h264_2	see.H.264(1)	see.H.264(1)
sDelivery_h264_2		
iBitrate_h264_2		
iResolution_h264_2		
iQuality_h264_2		
iMultiAuto_h264_2		

2.3. Specific Information (Capability) Acquisition

Method : POST,GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Specific information (capability) acquisition	/cgi-bin/get_capability	-	-	Explained under the next item

Usage example) Specific information (capability) acquisition

http://192.168.0.10/cgi-bin/get_capability

The description of the response data is as shown below.

Group name	Parameter name	Parameter value	Description
common	capability_version	1.00	Version of the capability format
	category	camera	Category
video_server.basic	type	fixed_dome	Product shape
	fisheye	no	Fisheye camera
video_server.basic.analogue_input	supported	ntsc,pal	Supported video signals of the analog camera (encoder)
video_server.cam_ctrl.ptz	supported	yes	Availability of PTZ function
	zoom	20	Zoom magnification
	el_zoom	30	Electronic zoom magnification
	command	camctrl direct_16 direct_256d direct_256r	Supported PTZ commands
video_server.cam_ctrl.brightness	supported	yes	Support for brightness control command
	command	camctrl_bright camctrl_IRIS	Types of supported commands
video_server.cam_ctrl.abf	supported	no	Support for ABF command
video_server.cam_ctrl.focus	supported	yes	Support for focus command
video_server.cam_ctrl.auto_focus	supported	yes	Support for auto-focus command
video_server.cam_ctrl.bw	supported	no	Support for black and white selection command
video_server.cam_ctrl.auto_mode	supported	no	Support for auto mode
video_server.cam_ctrl.preset	supported	no	Support for preset movement command
video_server.image.sensor	aspect_ratio	16_9	Aspect ratio of sensor
video_server.image	format	jpeg, mjpeg, h264	Supported image transmission format
	mode	2m_r16_9	Supported imaging mode

Group name	Parameter name	Parameter value	Description
video_server.image.jpeg	resolution	640x360	Resolution parameters supported in the JPEG1 shot
	quality	0 to 9	Image quality parameters supported in the JPEG1 shot
video_server.image.jpeg.resolution_each_mode	2m_r16_9	640x360	Transmission-enabled JPEG resolution
video_server.image.jpeg.resolution_each_mode_all	2m_r16_9	640x360	Transmission-enabled JPEG resolution
video_server.image.jpeg.max_size	640x360	60,60,60,60,60,30,30,30,30,30,	<p>Max. data size of one JPEG image per resolution Unit [Kbyte]</p> <p>Values are separated by a comma and enumerated. Configuration: <Value 1>,<Value 2>,<Value 3>,<Value 4>,<Value 5>,<Value 6>, ..., <Value (n)>, ,,</p> <p>When video_server.image.jpeg.quality (JPEG image quality setting parameter) is 0,1,2,3,4,5,6,7,8,9, it indicates the below-mentioned meaning.</p> <p><Value 1>: Max. data size when the JPEG image quality setting is "0" <Value 2>: Max. data size when the JPEG image quality setting is "1" ... <Value 10>: Max. data size when the JPEG image quality setting is "9"</p>
video_server.image.mjpeg	resolution	640x360	Resolution parameters supported in the JPEG stream
	quality	0 to 9	Image quality parameters supported in the JPEG stream
	framerate	1 to 30	Frame rates supported in the JPEG stream Rounded down to the nearest whole number NTSC: 1 to 30 PAL: 1 to 25
video_server.image.mjpeg.max_framerate	2m_r16_9	30	Max. frame rate of JPEG stream
video_server.image.mjpeg.resolution_each_mode	2m_r16_9	640x360	Setting-enabled JPEG resolution
video_server.image.mjpeg.resolution_each_mode_all	2m_r16_9	640x360	Setting-enabled JPEG resolution
video_server.image.h264	resolution	3840x2160, 1920x1080, 1280x720, 640x360	Resolution parameters supported in H.264(1)

Group name	Parameter name	Parameter value	Description
	stream_mode	bitrate, framerate, best_effort	Transmission modes supported in H.264(1)
	quality	fine, normal	Image quality parameters supported in H.264(1)
	bandwidth	1024,1536,2048, ,3072,4096,614 4,8192,10240,1 2288,14336,163 84,20480,24576 ,32768,40960,5 1200	Bit rate parameters supported in H.264(1)
	framerate	5,12.5,15,25,30, 50,60	Frame rate parameters supported in H.264(1)
video_server.image.h264.resolution_each_mode	2m_r16_9	3840x2160, 1920x1080, 1280x720, 640x360	Supported H.264(1) resolutions
video_server.image.h264.max_framerate	2m_r16_9	60	Supported max. H.264(1) frame rate
video_server.image.h264-2	Same as H264-1		
video_server.image.h264-2.resolution_each_mode			
video_server.image.h264-2.max_framerate			
video_server.audio	transmission	input	Audio transmission setting mode
video_server.audio.audio_input	number	1	Audio microphone input number
	encode_type	aac-1c_64K aac-1c_96K aac-1c_128K	Supported audio input encoding type
video_server.sdcard	supported	yes	Support for SD memory card function
	media_type	sd, sdhc, sdxc	Supported SD memory card type
video_server.sdcard.replay_mp4	supported	no	Support for the function for playing back MP4 files saved in the SD memory card inside the camera
video_server.network	nw_bandwidth	1024,2048,4096, ,8192,16384,32 768	Parameters supported in the overall transmission volume setting
video_server.network.ipv6	supported	no	IPv6 support status
video_server.network.https	supported	yes	HTTPS (SSL) support status
video_server.vmd	supported	no	VMD support status

2.4. JPEG-based Image Transmission

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
JPEG image transmission (MJPEG)	/cgi-bin/jpeg	connect	start stop	start: Starts JPEG image transmission stop: Stops JPEG image transmission
		framerate	1 5 15(12.5) 30(25)	1 fps 5 fps 15 (12.5) fps 30 (25) fps The values within () are for the case when the system frequency is 50 Hz
		resolution	640	640: 640x360
		UID	Numeric value	User ID * UID acquired by /cgi-bin/getuid
JPEG image transmission (MJPEG)	/cgi-bin/mjpeg	resolution	640	640: 640x360
		framerate	1 5 15(12.5) 30(25)	1 fps 5 fps 15 (12.5) fps 30 (25) fps The values within () are for the case when the system frequency is 50 Hz
		action	snapshot start stop	snapshot: Acquires one JPEG image start: Starts JPEG transmission stop: Stops JPEG transmission
JPEG image 1 shot request	/cgi-bin/view.cgi	n	Numeric value	Dummy for disabling cache
JPEG image 1 shot request	/cgi-bin/camera	resolution	640	640: 640x360
		page	Numeric value	Dummy for disabling cache

[Notes]

In a memory card portable recorder and special optional compact camera head, various techniques are provided for acquisition of JPEG video. Use the technique suitable to your purpose.

MJPEG

By continuously displaying the videos that arrive, a movie display can be realized.

The frame rate is decided based on the arguments.

Depending on the software and hardware at the receiving side, some frame rates may not be supported.

JPEG image 1 shot

By repeating the processes of acquisition, display, and standby for a single JPEG image, a movie display can be realized.

The frame rate is decided according to the standby time in the software and hardware at the receiving side.

The characteristics of each CGI of MJPEG are as described below.

/cgi-bin/jpeg

When CGI is called once, the MJPEG stream is transmitted continuously.

Before calling, the acquisition of UID with /cgi-bin/getuid is necessary.

In Internet Explorer, the plug-in software is used when calling JPEG(1).

Specific usage examples and sequences are described in the next chapter.

/cgi-bin/mjpeg

When CGI is called once, the MJPEG stream is transmitted continuously.

Before calling, the acquisition of UID with /cgi-bin/getuid is not necessary.

It is used when calling JPEG from some mobile terminals.

In Safari, movie display is possible by entering only this CGI in the URL field of the browser. Not supported by Internet Explorer.

Usage example) When acquiring a 640 x 360 video in 15 fps in the MJPEG format:

<http://192.168.0.10/cgi-bin/mjpeg?resolution=640&framerate=15>

Usage example) When acquiring a video of approx. 5 fps in the MJPEG format (parameter omitted):

<http://192.168.0.10/cgi-bin/mjpeg>

The characteristics of each CGI of JPEG image 1 shot are as described below.

/cgi-bin/view.cgi

When CGI is called once, only one JPEG image is transmitted.

Before calling, the acquisition of UID with /cgi-bin/getuid is not necessary.

Used when calling a JPEG image without the use of plug-in software in Internet Explorer.

Usage example) When acquiring a 640 x 360 video through a JPEG image 1 shot request:

<http://192.168.0.10/cgi-bin/view.cgi?action=start>

<http://192.168.0.10/cgi-bin/view.cgi?action=snapshot&n=3333>

<Appropriate standby time>

<http://192.168.0.10/cgi-bin/view.cgi?action=snapshot&n=3334>

<Appropriate standby time>

<http://192.168.0.10/cgi-bin/view.cgi?action=snapshot&n=3335>

While the "start" command is mandatory after turning the power supply ON, the "stop" command is not mandatory. The "start" command may be issued any number of times without any problem.

/cgi-bin/camera

When CGI is called once, only one JPEG image is transmitted.

Before calling, the acquisition of UID with /cgi-bin/getuid is not necessary.

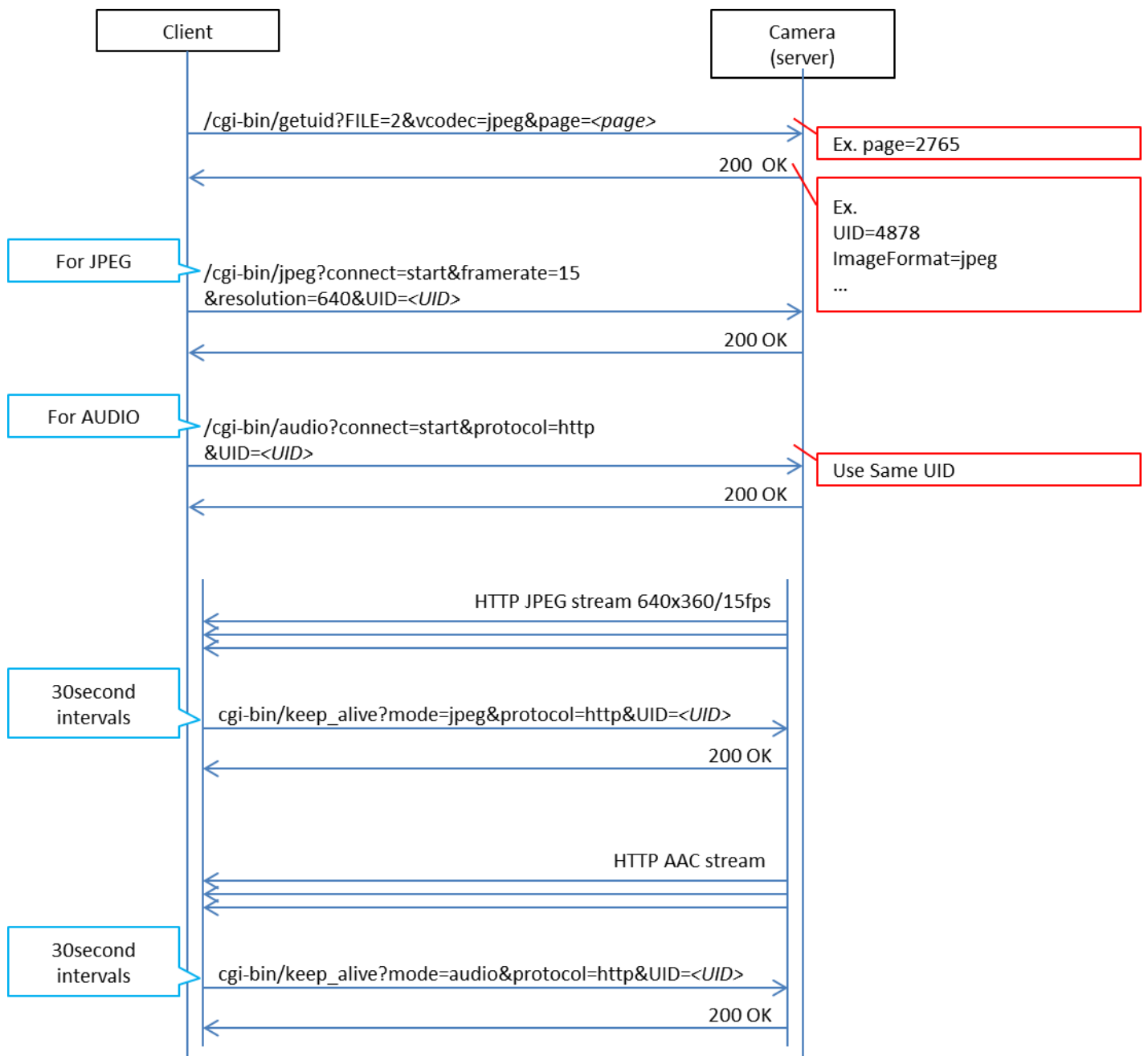
In Internet Explorer, the plug-in software is used when acquiring a screen shot.

The notes common for each CGI are as described below.

When a video is acquired simultaneously by several PCs and receivers, the best effort judgment is performed at the camera side. Therefore, the expected frame rate display may not be achieved.

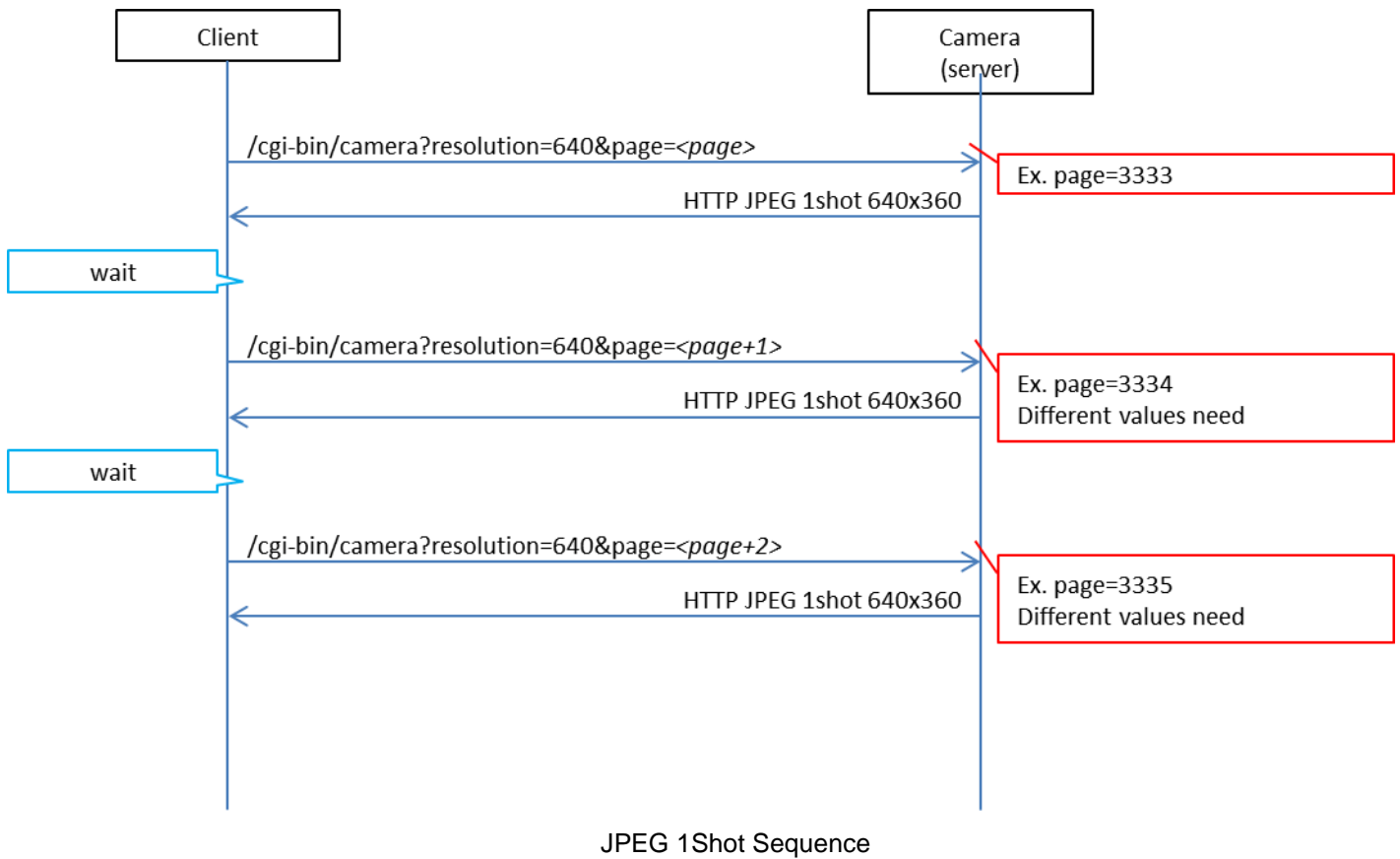
When the WEB menu/Video over IP/JPEG/JPEG transmission are OFF, the response may be in the form of a pitch black JPEG image.

2.5. Image Transmission Sequence based on MJPEG



MJPEG Sequence

2.6. Image Transmission Sequence based on JPEG Image 1 shot



2.7. H264/AUDIO-based Image Transmission

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
H.264 image transmission	/cgi-bin/h264	my_port	Numeric value	Reception port number of H.264 * This parameter cannot be omitted if unicast is set.
		connect	start stop	start: Starts H.264 transmission stop: Stops H.264 transmission
		protocol	rtp	rtp: RTP format (can be omitted)
		UID	Numeric value	User ID * UID acquired by /cgi-bin/getuid
		stream	1 2	1: Stream 1 2: Stream 2
Audio transmission	/cgi-bin/audio	connect	start stop	start: Starts audio transmission stop: Stops audio transmission
		protocol	rtp http	rtp: RTP transmission http: HTTP transmission
		my_port	Numeric value	Reception port number of audio data *Only when protocol = rtp Can be omitted during HTTP transmission
		UID	Numeric value	User ID * UID acquired by /cgi-bin/getuid
		mode	in	in: Fixed
Keep alive	/cgi-bin/keep_alive	mode	h.264 h.264_2 jpeg audio	h.264: H.264 keep alive h.264_2: H.264(2) keep alive jpeg: JPEG keep alive audio: Audio keep alive
		protocol	rtp http	rtp: RTP transmission http: HTTP transmission
		UID	Numeric value	User ID * UID acquired by /cgi-bin/getuid
		stream	1 2	1: Stream 1 2: Stream 2

Usage example) H264(1) image transmission start (when the port number is "40000" and User ID is "263")

http://192.168.0.10/cgi-bin/h264?my_port=40000&connect=start&protocol=rtp&UID=263&stream=1

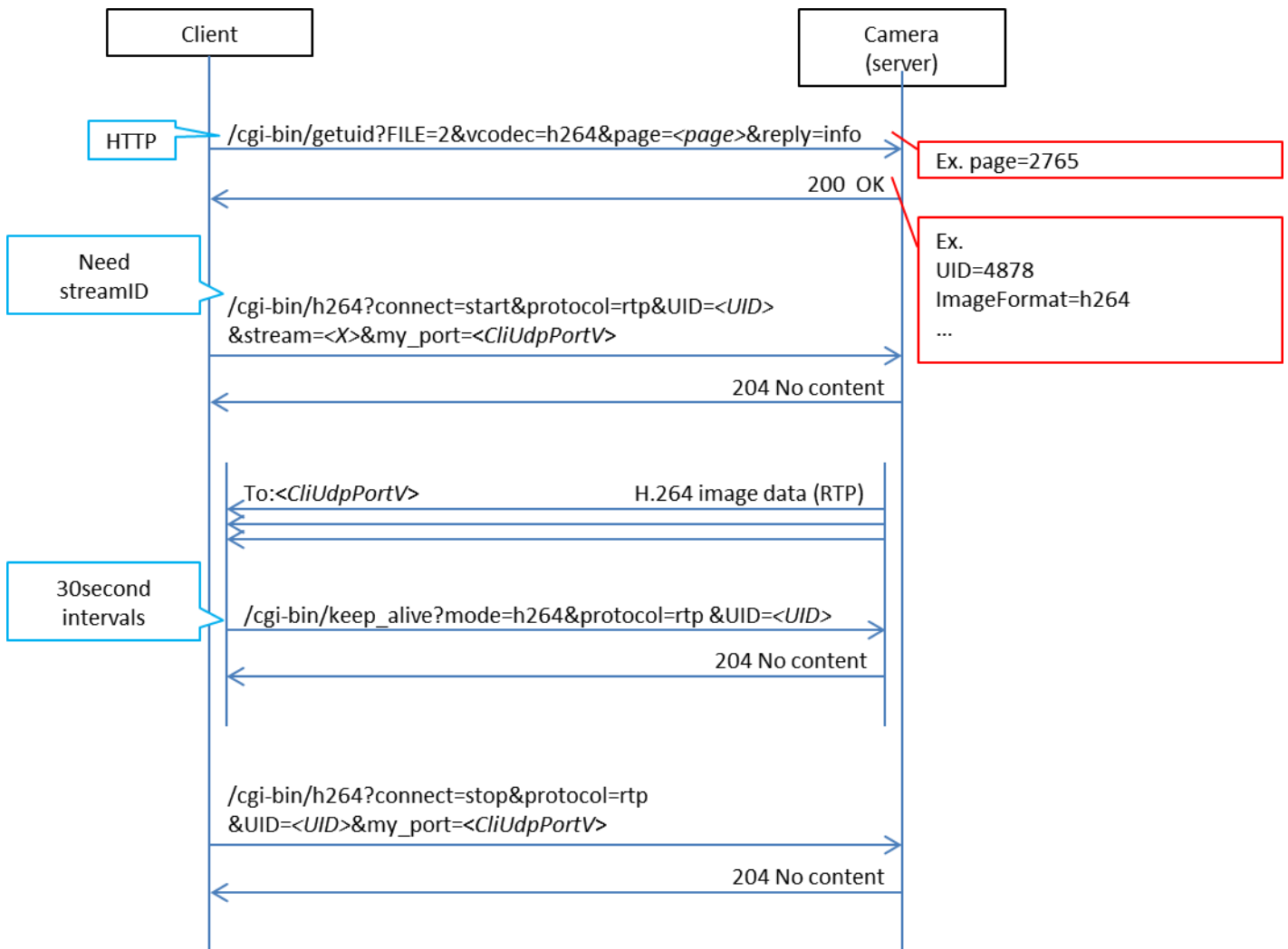
Usage example) Audio transmission start

http://192.168.0.10/cgi-bin/audio?my_port=38004&connect=start&protocol=rtp&UID=263&mode=in

Usage example) Keep alive (JPEG)

http://192.168.0.10/cgi-bin/keep_alive?mode=jpeg&protocol=http&UID=263

2.8. Unicast Image Transmission Sequence based on H264



H264 Sequence

3. CGI List for Camera Control

3.1. Camera control

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Camera control	/cgi-bin/camctrl	times	1 up down 0	1: Return to default setting up: ZOOM UP one level down: ZOOM DOWN one level 0: Return to default setting
		zoom	1 up down 0	1: Return to default setting up: ZOOM UP one level down: ZOOM DOWN one level 0: Return to default setting
		bright	1 up down -2 0 2	1: Return to default setting up: Turn brightness one level UP down: Turn brightness one level DOWN -2: Turn brightness two levels DOWN 0: Return brightness to standard value (reset) 2: Turn brightness two levels UP
		iris	1 up down -2 0 2	1: Return to default setting up: Turn brightness one level UP down: Turn brightness one level DOWN -2: Turn brightness two levels DOWN 0: Return brightness to standard value (reset) 2: Turn brightness two levels UP
		focus	-3,3,on	-3: Near, 3: Far, on: Auto
		af	-3,3,on	-3: Near, 3: Far, on: Auto
		Camera control direct	/cgi-bin/directctrl	zoom
		focus	-4 to 4	A negative value indicates near and a positive value indicates far

* Control will be of the special optional compact camera head.

* This CGI is for backward compatibility. In a compact camera head, the use of cgi-bin/aw_ptz enables high-functionality control.

4. CGI List for Various Settings

4.1. Priority Mode / Basic Settings

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Priority mode setting	/cgi-bin/set_priority_mode	mode	ip rec_pb ip_4k rec_pb_4k	IP REC/PB IP(4K) REC/PB(4K)
Basic settings	/cgi-bin/set_basic	cam_title	String	Camera title (within 20 characters)
		plugin_download	enable disable	Auto installation of plug-in software enable: Allowed disable: Not allowed
		plugin_disp	0 1	0: Real time consideration (Off) 1: Smooth display (On)

Usage example) Set the priority mode to IP

http://192.168.0.10/cgi-bin/set_priority_mode?mode=ip

Usage example) Set the camera title

http://192.168.0.10/cgi-bin/set_basic?cam_title=UCK20

4.2. NTP / Clock Settings

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
NTP settings	/cgi-bin/time	time_adjust	0	0: Manual
			1	1: Synchronized with the NTP server
		ntp_addr_dhcp	0	0: OFF (manual input)
			1	1: ON (acquired from DHCP)
		ntp_addr	String	IP address (IPv4)
		ntp_port	Numeric value	1 to 65535
ntp_interval	Numeric value	1 to 24 (hours)		
Clock settings	/cgi-bin/date_time	display	0	0:off
			1	1:on
		date_year	2013 to 2035	Year
		date_month	1 to 12	Month
		date_day	1 to 31	Day
		date_hour	0 to 23	Hour
		date_min	0 to 59	Minutes
		date_sec	0 to 59	Seconds
timezone	1 to 33	1:GMT-11:00 2:GMT-10:00 3:GMT-09:00 4:GMT-08:00 5:GMT-07:00 6:GMT-06:00 7:GMT-05:00 8:GMT-04:30 9:GMT-04:00 10:GMT-03:30 11:GMT-03:00 12:GMT-02:00 13:GMT-01:00 14:GMT 15:GMT+01:00 16:GMT+02:00 17:GMT+03:00 18:GMT+03:30 19:GMT+04:00 20:GMT+04:30 21:GMT+05:00 22:GMT+05:30 23:GMT+05:45 24:GMT+06:00 25:GMT+06:30 26:GMT+07:00		

CGI item name	URL	Parameter name	Parameter value	Description
				27:GMT+08:00 28:GMT+09:00 29:GMT+09:30 30:GMT+10:00 31:GMT+11:00 32:GMT+12:00 33:GMT+12:45
		summer_time	0 1 2	0: Summer time is not set (Out) 1: Summer time is set (In) 2: Summer time is auto-adjusted according to (Start/End) (Auto)
		start_month	1 to 12	1: January to 12: December
		start_week	1 to 5	1: First week, 2: Second week, 3: Third week, 4: Fourth week, 5: Last week
		start_dotw	0 to 6	0: Sunday to 6: Saturday
		start_hour	0 to 23	0 to 23
		end_month	1 to 12	1: January to 12: December
		end_week	1 to 5	1: First week, 2: Second week, 3: Third week, 4: Fourth week, 5: Last week
		end_dotw	0 to 6	0: Sunday to 6: Saturday
		end_hour	0 to 23	0 to 23

Usage example) NTP settings

http://192.168.0.10/cgi-bin/time?time_adjust=1&ntp_addr_dhcp=0&ntp_addr=192.168.0.1&ntp_port=123&ntp_interval=12

Usage example) Clock settings

http://192.168.0.10/cgi-bin/date_time?display=0&date_year=2018&date_month=1&date_day=1&date_hour=0&date_min=0&date_sec=0&summer_time=0

4.3. Video over IP Settings

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
JPEG settings	/cgi-bin/set_jpeg	jpeg_quality	0 to 9	0 to 4: High image quality 5 to 9: Low image quality
		resol_stream1	640	640 : 640x360
		jpeg_transmit 1	0 1	0: OFF Do not transmit 1: ON Transmit
		jpeg_interval1	5 15(12.5) 30(25)	Frame rate of JPEG(1) 5:5 fps 15 (12.5): 15 (12.5) fps 30 (25): 30 (25) fps * The values within () are for the case when the system frequency is 50 Hz
JPEG stream settings	/cgi-bin/setdata	LIVESIZE	640	Resolution of JPEG(1)
		LIVEQUAL	0 to 9	Image quality of JPEG(1) 0 to 4: High image quality 5 to 9: Low image quality
H.264(1) stream settings	/cgi-bin/set_h264	h264_transmit 1	0 1	0: OFF Do not transmit 1: ON Transmit
		h264_rtsp_mode	0 1	Internet mode settings 0: OFF 1: ON
		h264_resolution	640 1280 1920 3840	640: 640x360 1280: 1280x720 1920: 1920x1080 3840: 3840x2160
		f_priority	0 1 2	0: Fixed bit rate 1: Frame rate priority 2: Best effort transmission
		framerate	5 15(12.5) 30(25) 60(50)	5: 5 fps 15 (12.5): 15 (12.5) fps 30 (25): 30 (25) fps 60 (50): 60 (50) fps * The values within () are for the case when the system frequency is 50 Hz

CGI item name	URL	Parameter name	Parameter value	Description
		h264_bandwidth	1024 1536 2048 3072 4096 6144 8192 10240 12288 14336 16384 20480 24576 32768 40960 51200	1024:1024(kbps) 1536:1536(kbps) 2048:2048(kbps) 3072:3072(kbps) 4096:4096(kbps) 6144:6144(kbps) 8192:8192(kbps) 10240:10240(kbps) 12288:12288(kbps) 14336:14336(kbps) 16384:16384(kbps) 20480:20480(kbps) 24576:24576(kbps) 32768:32768(kbps) 40960:40960(kbps) 51200:51200(kbps)
		h264_bandwidth_min	1024 to 51200	* Can be set when f_priority = 2 (Best effort transmission)
		h264_quality	Fine low	fine: Image quality priority low: Motion priority
		h264_unimulti	uni multi uni_manual	uni: unicast(auto) multi: multicast uni_manual: unicast(manual)
		unicast_port	1024 to 50000	Port number: 1024 to 50000
		unicast_audio_port	1024 to 50000	Port number: 1024 to 50000
		multicast_address_r1	224 to 239	224.0.0.0 - 239.255.255.255
		multicast_address_r2	0 to 255	
		multicast_address_r3	0 to 255	
		multicast_address_r4	0 to 255	
		multicast_address_r	*.*.* format	
		multicast_port	1024 to 50000	1024 to 50000
		multicast_ttl	1 to 254	1 to 254
H.264(2) stream settings	/cgi-bin/set_h264_2	h264_transmit	0 1	0: OFF Do not transmit 1: ON Transmit
		h264_rtsp_mode	0 1	Internet mode settings 0: OFF 1: ON
		h264_resolution	640 1280	640:640x360 1280:1280x720

CGI item name	URL	Parameter name	Parameter value	Description
		f_priority	0 1 2	0: Fixed bit rate 1: Frame rate priority 2: Best effort transmission
		framerate	5 15(12.5) 30(25)	5: 5 fps 15 (12.5): 15 (12.5) fps 30 (25): 30 (25) fps * The values within () are for the case when the system frequency is 50 Hz
		h264_bandwidth	1024 1536 2048 3072 4096 6144 8192 10240 12288 14336 16384 20480 24576	1024:1024(kbps) 1536:1536(kbps) 2048:2048(kbps) 3072:3072(kbps) 4096:4096(kbps) 6144:6144(kbps) 8192:8192(kbps) 10240:10240(kbps) 12288:12288(kbps) 14336:14336(kbps) 16384:16384(kbps) 20480:20480(kbps) 24576:24576(kbps)
		h264_bandwidth_min	1024 to 24576	* Can be set when f_priority = 2 (Best effort transmission)
		h264_quality	fine low	fine: Image quality priority low: Motion priority
		h264_unimulti	uni multi uni_manual	uni: unicast(auto) multi: multicast uni_manual: unicast(manual)
		unicast_port	1024 to 50000	Port number: 1024 to 50000
		unicast_audio_port	1024 to 50000	Port number: 1024 to 50000
		multicast_address_r1	224 to 239	224.0.0.0 - 239.255.255.255
		multicast_address_r2	0 to 255	
		multicast_address_r3	0 to 255	
		multicast_address_r4	0 to 255	
		multicast_address_r	*.*.* format	*.*.* format
		multicast_port	1024 to 50000	1024 to 50000
		multicast_ttl	1 to 254	1 to 254

CGI item name	URL	Parameter name	Parameter value	Description
RTSP settings	/cgi-bin/set_rtsp	rtsp_port	1 to 65535	1 to 65535 * Set to 554 according to factory settings
		h264_rtsp_mode	0 1	Internet mode settings of H264(1) 0: OFF Do not Transmit 1: ON Transmit
		h264_rtsp_mode2	0 1	Internet mode settings of H264(2) 0: OFF Do not Transmit 1: ON Transmit
Live screen initial stream selection	/cgi-bin/set_livestart	stream	h264 h264_2 jpeg	h264:H264(1) h264_2:H.264(2) jpeg:JPEG(1)

4.4 Audio Settings

Method : POST/GET

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Audio settings	/cgi-bin/set_audio	audio	off in 0 1	off : OFF in : ON 0: OFF 1: ON * Set this with audio_sens as a set.
		audio_encoder	aac	Encoder settings AAC (fixed)
		audio_sens	lmiddle line_middle sdi	middle: Microphone line_middle: Line sdi:SDI * Set this with audio = 1 as a set.
		audio_bitrate	64 96 128	64: 64 Kbps 96: 96 Kbps 128: 128 Kbps
		audio_alc	0 1	0: ALC settings OFF 1: ALC settings ON
		plugin_power	0 1	0 : Off 1 : On
		audio_transmit	0 1	0 : Off 1 : On
		equalizer	off low_cut	off: Off low_cut: Low cut
		audio_lv_auto	0 1	0: Off (manual setting) 1: On (auto setting)
		mic_select	external internal	external External microphone internal Internal microphone

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Volume level setting	/cgi-bin/set_volume_lv	volume_lv	0 to 23	0 to 23 levels

* When enabling audio input, set audio and audio_sens as a set.
If audio_sens is not specified, an error will be returned.

Usage example) Setting audio input to the internal microphone when using the camera head
http://192.168.0.10/cgi-bin/set_audio?audio=1&audio_sens=middle&mic_select=internal

Usage example) Setting audio input to the external microphone when using the recorder
http://192.168.0.10/cgi-bin/set_audio?audio=1&audio_sens=middle&mic_select=external

Usage example) Setting audio input to LINE when using the recorder
http://192.168.0.10/cgi-bin/set_audio?audio=1&audio_sens=line_middle

Usage example) Setting audio input to SDI when using the recorder
http://192.168.0.10/cgi-bin/set_audio?audio=1&audio_sens=sdi

Usage example) Setting audio input to a plug-in powered microphone when using the recorder
http://192.168.0.10/cgi-bin/set_audio?audio=1&audio_sens=middle&mic_select=external&plugin_power=1

Usage example) Setting audio input to OFF
http://192.168.0.10/cgi-bin/set_audio?audio=0

4.5. Multi-screen Settings

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Multi-screen settings	/cgi-bin/multi_screen	multi_addr1	"*.*.*" format	"*.*.*" format or "*.*.*": 1 to 65535" or "String" or "String": 1 to 65535"
		multi_addr2	or	
		multi_addr3	"*.*.*": 1 to	
		multi_addr4	65535" or	
		multi_addr5	"String" or	
		multi_addr6	"String": 1 to	
		multi_addr7	65535"	
		multi_addr8		
		multi_addr9		
		multi_addr10		
		multi_addr11		
		multi_addr12		
		multi_addr13		
		multi_addr14		
		multi_addr15		
		multi_addr16		
		multi_name1	String (within 20 double-byte characters)	Name of the camera
		multi_name2		
		multi_name3		
		multi_name4		
		multi_name5		
		multi_name6		
		multi_name7		
		multi_name8		
		multi_name9		
		multi_name10		
		multi_name11		
		multi_name12		
		multi_name13		
		multi_name14		
		multi_name15		
		multi_name16		

Usage example) Set 192.168.0.100/UCK20 in the first frame.

http://192.168.0.10/cgi-bin/multi_screen?multi_addr1=192.168.0.100&multi_name1=UCK20

4.6. rk Settings

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Network settings	/cgi-bin/network	dhcp	0 1	0: DHCP OFF (Static settings) 1: DHCP ON
		IP_addr1	0 to 255	IP address First octet
		IP_addr2	0 to 255	IP address Second octet
		IP_addr3	0 to 255	IP address Third octet
		IP_addr4	0 to 255	IP address Fourth octet
		netmask1	0 to 255	Subnet mask First octet
		netmask2	0 to 255	Subnet mask Second octet
		netmask3	0 to 255	Subnet mask Third octet
		netmask4	0 to 255	Subnet mask Fourth octet
		gateway1	0 to 255	Default gateway First octet
		gateway2	0 to 255	Default gateway Second octet
		gateway3	0 to 255	Default gateway Third octet
		gateway4	0 to 255	Default gateway Fourth octet
		port	1 to 65535	1 to 65535
		dns	manual auto	manual: Manual setting auto: Auto setting
		pri_server1	0 to 255	Primary server address (DNS) First octet
		pri_server2	0 to 255	Primary server address (DNS) Second octet
		pri_server3	0 to 255	Primary server address (DNS) Third octet
		pri_server4	0 to 255	Primary server address (DNS) Fourth octet
		sec_server1	0 to 255	Secondary server address (DNS) First octet
		sec_server2	0 to 255	Secondary server address (DNS) Second octet
		sec_server3	0 to 255	Secondary server address (DNS) Third octet
		sec_server4	0 to 255	Secondary server address (DNS) Fourth octet
rtp_packet_max	1500 1280	RTP packet max. transmission size 1500: Unlimited (1500 byte) 1280: Limited (1280 byte)		
mss	1460 1280 1024	Max. segment size of TCP (MSS) 1460: Unlimited (1460 byte) 1280: Limited (1280 byte) 1024: Limited (1024 byte)		

CGI item name	URL	Parameter name	Parameter value	Description
		time	20 unlimited	Effective limit 20: 20 minutes unlimited: Unlimited
		bandwidth	0 1024 2048 4096 8192 16384 32768 10000	Transmission volume of entire network 0: Unlimited 1024: 1024kbps 2048: 2048kbps 4096: 4096kbps 8192: 8192kbps 16384: 16384kbps 32768: 32768kbps 10000: Unlimited * When 10000 is received, an error is not issued, and the operation is performed by assuming "Unlimited".
		rtsp_port	1 to 65535	The RTSP waiting port
Easy IP Setup protocol settings	/cgi-bin/easyipset	time	unlimited, 20	Time period during which Easy IP Setup can be performed from the time power is turned ON unlimited: Unlimited 20: 20 minutes
Transmission volume of entire network	/cgi-bin/set_bandwidth	bandwidth	0 1024 2048 4096 8192 16384 32768 10000	Transmission volume of entire network 0: Unlimited 1024: 1024kbps 2048: 2048kbps 4096: 4096kbps 8192: 8192kbps 16384: 16384kbps 32768: 32768kbps 10000: Unlimited * When 10000 is received, an error is not issued, and the operation is performed by assuming "Unlimited".
Max. packet length settings	/cgi-bin/set_rtp	rtp_size	1280 1500	1280: Max. packet length limit 1500: Normal packet length

4.7. UPnP Settings

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
UPnP settings	/cgi-bin/upnp	upnp_portmap	0 1	Auto port-forwarding 0: Disabled 1: Enabled

Usage example) Set UPnP to ON

http://192.168.0.10/cgi-bin/upnp?upnp_portmap=1

4.8. Restarting

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Initialization	/cgi-bin/initial	cmd	reset	Camera restart
		Randomnum	Hexadecimal string	16 single-byte character string

Usage example) Restarting

<http://192.168.0.10/cgi-bin/initial?cmd=reset&Randomnum=12345>

5. CGI List for Acquisition of Different Types of Information

5.1. Priority Mode Settings Information Acquisition

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Priority mode acquisition	/cgi-bin/get_priority_mode			

The response data is as shown below.

priority_mode = xxx

* For details on the value notified by xxx, see the parameters of set_priority_mode.

5.2. Basic Settings Information Acquisition

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Basic settings information acquisition	/cgi-bin/get_basic			

The response data is as shown below.

cam_title = Camera title

plugin_download = enable/disable

plugin_disp = 0/1

5.3. NTP Settings Information Acquisition

Method : GET
Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
NTP settings information acquisition	/cgi-bin/get_time			

The response data is as shown below.

time_adjust = 0/1
ntp_addr_dhcp = 0/1
ntp_addr = String
ntp_port = Numeric value (1 to 65535)
ntp_interval = Numeric value (1 to 24)

5.4. Clock Settings Information Acquisition

Method : GET
Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Clock settings information acquisition	/cgi-bin/get_date_time			

The response data is as shown below.

display = 0/1
date_year = Numeric value
date_month = Numeric value
date_day = Numeric value
date_hour = Numeric value
date_min = Numeric value
date_sec = Numeric value
timezone = Numeric value (1 to 74)
summer_time = 0/1/2
start_month = Numeric value
start_week = Numeric value (1 to 5)
start_dotw = Numeric value (0 to 6)
start_hour = (0 to 23)
end_month = Numeric value
end_week = Numeric value (1 to 5)
end_dotw = Numeric value (0 to 6)
end_hour = Numeric value (0 to 23)
is_summer_time = 0/1 (0: OFF, 1: ON)

5.5. VideoOverIP Screen Information Acquisition

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
VideoOverIP screen information acquisition	/cgi-bin/get_video_over_ip			<ul style="list-style-type: none"> Responses are issued in a random order. If transmission for a specific channel is not possible due to the specifications, the response for the desired channel is not returned or is an invalid value.

The response data is as shown below.

```

livestart_stream=h264/h264_2/jpeg
jpeg_quality=1/5
resol_stream1=640
jpeg_transmit1=0/1
jpeg_interval1=5/15(12.5)/30(25)
h264_transmit_ch1=0/1
h264_transmit_ch2=0/1
h264_rtsp_mode_ch1=0/1
h264_rtsp_mode_ch2=0/1
h264_resolution_ch1=640/1280/1920/3840
h264_resolution_ch2=640/1280
h264_f_priority_ch1=0/1/2
h264_f_priority_ch2=0/1/2
h264_framerate_ch1=5/15(12.5)/30(25)/60(50)
h264_framerate_ch2=5/15(12.5)/30(25)
h264_bandwidth_ch1 = Numeric value
h264_bandwidth_ch2 = Numeric value
h264_bandwidth_min_ch1 = Numeric value
h264_bandwidth_min_ch2 = Numeric value
h264_quality_ch1=fine/low1/5
h264_quality_ch2=fine/low1/5
h264_unimulti_ch1=uni/multi/uni_manual
h264_unimulti_ch2=uni/multi/uni_manual
h264_unicast_port_ch1 = Numeric value (1024 to 50000)
h264_unicast_port_ch2 = Numeric value (1024 to 50000)
h264_unicast_audio_port_ch1 = Numeric value (1024 to 50000)
h264_unicast_audio_port_ch2 = Numeric value (1024 to 50000)
h264_multicast_addr_ch1=xxx.xxx.xxx.xxx
h264_multicast_addr_ch2=xxx.xxx.xxx.xxx
h264_multicast_port_ch1 = Numeric value (1024 to 50000)
h264_multicast_port_ch2 = Numeric value (1024 to 50000)
h264_multicast_ttl_ch1 = Numeric value (1 to 254)
h264_multicast_ttl_ch2 = Numeric value (1 to 254)

```

5.6. Audio Settings Information Acquisition

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Audio settings information acquisition	/cgi-bin/get_audi o			

For the response data, see /cgi-bin/set_audio.

5.7. Multi-screen Settings Information Acquisition

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Multi-screen settings information acquisition	/cgi-bin/get_multi _screen			

The response data is as shown below.

multi_addr1 = ".*.*.*" format/"*.*.*: 1 to 65535"/"String"/"String": 1 to 65535"

multi_name1 = String (within 20 double-byte characters)

multi_addr2 = ".*.*.*" format/"*.*.*: 1 to 65535"/"String"/"String": 1 to 65535"

multi_name2 = String (within 20 double-byte characters)

multi_addr3 = ".*.*.*" format/"*.*.*: 1 to 65535"/"String"/"String": 1 to 65535"

multi_name3 = String (within 20 double-byte characters)

multi_addr4 = ".*.*.*" format/"*.*.*: 1 to 65535"/"String"/"String": 1 to 65535"

...

multi_addr16 = ".*.*.*" format/"*.*.*: 1 to 65535"/"String"/"String": 1 to 65535"

multi_name16 = String (within 20 double-byte characters)

5.8. Network Settings Information Acquisition

Method : GET
Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Network settings information acquisition	/cgi-bin/get_network			

The response data is as shown below.

```
ip4_dhcp=0/1  
ip4_addr=*. *.*.*  
ip4_netmask=*. *.*.*  
ip4_gateway=*. *.*.*  
ip4_pri_server=*. *.*.*  
ip4_sec_server=*. *.*.*  
port = Numeric value (1 to 65535)  
dns=auto/manual  
rtp_packet_max=1500/1280  
mss=1024/1280/1460  
bandwidth=0/64/128/256/384/512/768/1024/2048/4096/8192  
time=20/unlimited  
rtsp_port=0 (Fixed)
```

5.9. UPnP Settings Information Acquisition

Method : GET
Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
UPnP settings information acquisition	/cgi-bin/get_upnp			

The response data is as shown below.

```
upnp_portmap = 0/1
```

5.10. UPnP Execution Results Acquisition

Method : GET
Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Status acquisition	/cgi-bin/get_status	-	-	UPnP execution result

The response data is as shown below.

http_port = Numeric value
http_status = enable/disable
https_port = Numeric value
https_status = enable/disable
addr = String

5.11. System Log Information Acquisition

Method : GET
Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
System log	/cgi-bin/get_systemlog	type	eventlog	eventlog: Event log
		num	Numeric value (1 to 300)	Acquisition number
		index	Numeric value (1 to 300)	Acquisition start position

Usage example) Event log acquisition

http://192.168.0.10/cgi-bin/get_systemlog?type=eventlog

The response data is as shown below.

```
no¥mm/dd/yyyy hh:mm¥event code¥description$no¥mm/dd/yyyy hh:mm¥event code¥description$
.
.
.
```

* No line feed.

A "¥" is entered between two parameters.

A "\$" is entered between numbers, such as between no1 and no2.

5.12. Other Setting Values Acquisition

Method : GET
Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Setting value acquisition CGI	/cgi-bin/getdata	req	-	Specify the item name of the setting value to be acquired.
			img_mode	Imaging mode
			imgratio	Image ratio
			img_fps	Frame rate
			livestream	Live screen initial stream selection
			liveint	liveint: JPEG(1) refresh interval
			livequalbase	livequalbase: JPEG(1) default image quality
			livesize	livesize: JPEG(1) image resolution
			livequal	livequal: JPEG(1) image quality
			h264	H264(1) transmission ON/OFF
			h264rtspmode	Internet mode (H.264 transmission 1) ON/OFF
			h264bwc	Bit rate per client
			nrh264bwc	Bit rate per client at which transmission does not stop
			h264bwcmin	H.264(1) Bit rate per client (minimum)
			h264rtspmode_2	h264rtspmode_2: Internet mode (H.264 transmission 2) ON/OFF
			rtspport	rtspport: RTSP server port number
			h264size	h.264size: h.264 resolution
			h264qual	h.264qual: h.264 image quality
			h264rint	h.264rint: Refresh cycle (1 frame cycle)
			h264mtd	h.264mtd: h.264 transmission method
			h264mladd1	h.264mladd1: h.264 multicast address First octet
			h264mladd2	h.264mladd2: h.264 multicast address Second octet
			h264mladd3	h.264mladd3: h.264 multicast address Third octet
			h264mladd4	h.264mladd4: h.264 multicast address Fourth octet
			h264mlport	h.264mlport: h.264 multicast transmission destination port number
			h264mlttl	h.264mlttl: h.264 multicast TTL
			h264uniport	h.264uniport: Unicast (for video) port number
h264uniport2	h.264uniport2: Unicast (for audio) port number			

CGI item name	URL	Parameter name	Parameter value	Description
			h264profile	H.264 profile
			h264codind	H.264 encoding system
			h264_2	h.264_2: h.264 transmission ON/OFF2
			h264bwc_2	h.264bwc_2: Bit rate 2 per client
			h264size_2	h.264size_2: h.264 resolution 2
			h264qual_2	h.264qual_2: h.264 image 2
			h264rint_2	h.264rint_2: Refresh cycle (1 frame cycle) 2
			h264mtd_2	h.264mtd: h.264 transmission method 2
			h264mladd1_2	h.264mladd1_2: h.264 multicast address First octet 2
			h264mladd2_2	h.264mladd2_2: h.264 multicast address Second octet 2
			h264mladd3_2	h264mladd3_2: h264 multicast address Third octet 2
			h264mladd4_2	h264mladd4_2: h264 multicast address Fourth octet 2
			h264mlport_2	h264mlport_2: h264 multicast transmission destination port number 2
			h264mlttl_2	h264mlttl_2: h264 multicast TTL2
			h.264uniport_2	h.264uniport_2: Unicast (for video) port number 2
			h264uniport2_2	h.264uniport2_2: Unicast (for audio) port number 2
			h264profile_2	H.264 profile 2
			h264codind_2	H.264 encoding system 2
			h264mlauto	H264(1) multicast auto start
			h264mlauto_2	H264(2) multicast auto start
			audio_level	audio_level: Audio authorization and authentication level setting
			audio_sens	audio_sens: Sound collection sensitivity
			nrlivequal	nrlivequal: JPEG image quality at which transmission does not stop
			nrh264size	nrh264size: H.264 resolution at which transmission does not stop
			nrh264qual	nrh264qual: H.264 image quality at which transmission does not stop
			nrh264bwc_2	nrh264bwc_2: Bit rate per client 2 at which transmission does not stop
			nrh264size_2	nrh264size_2: H.264 resolution 2 at which transmission does not stop

CGI item name	URL	Parameter name	Parameter value	Description
			nrh264qual_2	nrh264qual_2: H.264 image quality 2 at which transmission does not stop
			h264fpriority	h264fpriority: H.264(1) transmission mode
			h264nrframerate	h264nrframerate: H.264(1) frame rate
			h264fpriority_2	h264fpriority_2: H.264(2) transmission mode
			h264nrframerate_2	h264nrframerate_2: H.264(2) frame rate
			h264bwcmmin_2	H.264(2) Bit rate per client (minimum)
			livequalbase	JPEG default image quality
			liveframerate	Live screen initial frame rate (JPEG)
			plugin_half_tone_jpeg	Enabling/disabling of half-tone function for JPEG images in Active X
			plugin_half_tone_h264	Enabling/disabling of half-tone function for H.264 movies in Active X
		(None)	—	If there is no parameter specification, issue the list of setting data in a batch, as the response.

For details, see "Acquiring the List of Setting Values."

6. Acquiring the List of Setting Values

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Acquisition of list of setting values	/cgi-bin/setdata			Parameters are not required.

The description of the response data is as shown below.

Setting name	Value	Description
CAMTITLE	String	Camera name
IMAGESELECT	2m	Imaging mode 2m: 2 M pixel
IMAGERATIO	16_9	Image ratio 16_9: 16:9 mode
IMAGEFPS	30	Frame rate 30: 30 fps
LIVESTREAM	h264 h264_2 jpeg	Live screen initial stream selection h264:H264(1) h264_2:H264(2) jpeg:JPEG(1)
LIVEINT	1 5 15(12.5) 30(25)	JPEG(1) refresh interval 1:1fps 5:5fps 15(12.5):15(12.5)fps 30(25):30(25)fps * The values within () are for the case when the system frequency is 50 Hz
LIVEQUALBASE	1	JPEG(1) default image quality 1: Image quality 1
LIVESIZE	640	JPEG(1) image resolution 640:640x360
LIVEQUAL	1 5	JPEG(1) image quality 1: Fine 5: Normal
STREAMMODE	1	Movie transmission method 1: H264
H264	0	H264 transmission ON/OFF 0: OFF 1: ON
H264_2	1	
H264RTSPMODE	0	Internet mode ON/OFF 0: OFF 1: ON
H264RTSPMODE_2	1	
H264BWC	512,768,1024,1536,	Bit rate per client

Setting name	Value	Description
H264BWC_2	2048,3072,4096,6144, 8192,10240,12288, 14336,16384,20480, 24576,32768,40960, 51200	512 (kbps) to 24576 (kbps) to 51200(kbps)
H264BWCMIN	512,768,1024,1536, 2048,3072,4096,6144, 8192,10240,12288,	Minimum bit rate per client 512 (kbps) to
H264BWCMIN_2	14336,16384,20480, 24576,32768,40960, 51200	24576 (kbps) to 51200(kbps)
NRH264BWC	Numeric value	Bit rate per client at which transmission does not stop
NRH264BWC_2		Unit [kbps] * The value acquired by setdata depends on the minimum bit rate per client.
H264SIZE	640 1280 1920 3840	H264(1) resolution 640:640x360 1280:1280x720 1920:1920x1080
H264SIZE_2	640 1280	H264(2) resolution 640:640x360 1280:1280x720
NRH264SIZE	640 1280 1920 3840	H264(1) resolution at which transmission does not stop 640:640x360 1280:1280x720 1920:1920x1080 3840:3840x2160 The value acquired by setdata depends on the value of H264(1).
NRH264SIZE_2	640 1280	H264(2) resolution at which transmission does not stop 640:640x360 1280:1280x720 The value acquired by setdata depends on the value of H264(2).
H264FPRIORITY	0 1	Transmission mode 0:Constant bit rate
H264FPRIORITY_2	2	1:Frame rate 2:Best effort
H264NRFRAMERATE	5 15(12.5) 30(25) 60(50)	H264(1) frame rate 5:5fps 15(12.5):15(12.5)fps 30(25):30(25)fps 60(50):60(50)fps * The values within () are for the case when the system frequency is 50 Hz

Setting name	Value	Description
H264NRFRAMERATE_2	5 15(12.5) 30(25)	H264(2) frame rate 5:5fps 15(12.5):15(12.5)fps 30(25):30(25)fps * The values within () are for the case when the system frequency is 50 Hz
H264QUAL	fine	H264 image quality
H264QUAL_2	low	fine: Image quality priority low: Motion priority
NRH264QUAL	normal	H264 image quality at which transmission does not stop
NRH264QUAL_2		normal: Standard
H264RINT	1	Refresh cycle
H264RINT_2		1: 1 second
H264MTD	uni	H264 transmission method
H264MTD_2	uni_manual multi	uni:Unicast port(AUTO) uni_manual:Unicast port(MANUAL) multi:Multicast
H264MLADD1	Numeric value	H264(1) multicast address First octet 224 to 239
H264MLADD2	Numeric value	H264(1) multicast address Second octet 0 to 255
H264MLADD3	Numeric value	H264(1) multicast address Third octet 0 to 255
H264MLADD4	Numeric value	H264(1) multicast address Fourth octet 0 to 255
H264MLADD1_2	Numeric value	H264(2) multicast address First octet 224 to 239
H264MLADD2_2	Numeric value	H264(2) multicast address Second octet 0 to 255
H264MLADD3_2	Numeric value	H264(2) multicast address Third octet 0 to 255
H264MLADD4_2	Numeric value	H264(2) multicast address Fourth octet 0 to 255
H264MLADD	IPv4 address	H264 multicast address
H264MLADD_2		
H264MLPORT	Numeric value	H264 multicast port
H264MLPORT_2		1024 to 50000
H264MLTTL	Numeric value	H264 multicast TTL
H264MLTTL_2		1 to 254
H264UNIPORT	Numeric value	H264 unicast (for video) port number
H264UNIPORT_2		1024 to 50000 (only even numbers)
H264UNIPORT2	Numeric value	H264 unicast (for audio) port number
H264UNIPORT2_2		1024 to 50000 (only even numbers)
H264PROFILE	0	H264 profile
H264PROFILE_2		0: High profile

Setting name	Value	Description
RTSPPORT	Numeric value	RTSP server port number
H264MLAUTO	0	Multicast delivery is started automatically. 0: OFF
H264MLAUTO_2		
AUDIO	in off	Audio settings in: ON off: OFF
AUDIOSENS	middle line_middle sdi	See section 5.6.
PLUGIN_POWER	0 1	See section 5.6.
AUDIOMIC	external internal	See section 5.6.
AUDIOBITRATE	64 96 128	Audio bit rate 64: 64 Kbps 96: 96 Kbps 128: 128 Kbps
AUDIOENC	2	Encoder settings 2: AAC
PLUGIN_HALFTONE _JPEG	0	Enabling/disabling of half-tone function for JPEG images in Active X 0: Disabled
PLUGIN_HALFTONE _H264	0	Enabling/disabling of half-tone function for H264 in Active X 0: Disabled

7. CGI List for HTTPS Control

7.1. Setting Information and Acquiring Certification

Method : GET

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
HTTPS self-signed certificate	https_self_signed	mode	get_info delete	get_info: Information confirmation delete: Delete
HTTPS CA certificate	https_signed	mode	get_info delete	get_info: Information confirmation delete: Delete
HTTPS CRT key history usage	https_crt_key	mode	refresh	Processing of CRT key refresh: Update
HTTPS connection method	set_https	live	http https	http :HTTP https: HTTPS
		https_port	1 to 65535	HTTPS port number
HTTPS self-signed certificate generate	https_creat_self_signed	common_name	String	Host name
		country	String	Country name
		state	String	Prefecture name
		locality	String	Locality name
		organization	String	Organization name
		organization_unit	String	Department name
HTTPS CSR generate	https_creat_signed	common_name	String	Host name
		country	String	Country name
		state	String	Prefecture name
		locality	String	Locality name
		organization	String	Organization name
		organization_unit	String	Department name
HTTPS CSR download	/cgi-bin/https_download_csr			
HTTPS CA certificate install	https_install_signed	-	-	-
HTTPS CRT key generate	https_change_crt_key	rsa_length	2048	2048: 2048bit
Status update	renewal	cgi_name	self_create csr_create ca_install key_create	self_create: Self-signed certificate creation status csr_create: CSR creation status ca_install: CA certificate installation status key_create: CRT key generation status

7.2. Information Acquisition

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
HTTPS settings information acquisition	/cgi-bin/get_https			
HTTPS CRT key information acquisition	/cgi-bin/get_crt_key			

It is recommended to implement the HTTPS settings through GUI from the WEB menu.
Some models may not have the HTTPS function.

8. CGI List for SD Card Recording

8.1. Video Recording Mode Settings

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
SD card recording mode settings	/cgi-bin/set_sdrec_mode	mode	mp4_2160_30p_50m mp4_2160_24p_50m mp4_2160_25p_50m	This can be set when using a camera head for REC/PB (4K).
			avchd_ps_1080_60p_28m avchd_ph_1080_60i_21m avchd_ph_1080_24p_21m avchd_ha_1080_60i_17m avchd_he_1080_60i_6m avchd_ph_720_60p_21m avchd_pm_720_60i_8m avchd_ps_1080_50p_28m avchd_ph_1080_50i_21m avchd_ha_1080_50i_17m avchd_he_1080_50i_6m avchd_ph_720_50p_21m avchd_pm_720_50i_8m	
			avchd_ph_1080_60i_21m_from_720 avchd_ha_1080_60i_17m_from_720 avchd_he_1080_60i_6m_from_720 avchd_ph_1080_50i_21m_from_720 avchd_ha_1080_50i_17m_from_720 avchd_he_1080_50i_6m_from_720	This can be set when using the recorder independently.

Usage example) Setting to PS1080/59.94p

http://192.168.0.10/cgi-bin/set_sdrec_mode?mode=avchd_ps_1080_60p_28m

8.2. Video Recording Mode Acquisition

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
SD card recording mode acquisition	/cgi-bin/get_sdrec_mode			

For the response data, see the setting side.

8.3. Video Recording Media Settings

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Video recording media settings	/cgi-bin/set_sdrec_target	device	sd1 sd2	sd1: SD card slot 1 sd2: SD card slot 2

8.4. Video Recording Media Acquisition

Method : GET

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Video recording media settings	/cgi-bin/get_sdrec_target			

For the response data, see the setting side.

8.5. Video Folder Name and File Name Settings for MP4 Format

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Recorder ID settings	/cgi-bin/set_recorder_num	recorder_num	0 to 16	The folder name of video data in MP4 format can be changed. For details, see the instruction manual.
Clip number reset	/cgi-bin/contentnum_reset			The folder number for the next recorded MP4 clip is newly updated, and the file number begins from 0001.

For details, see each function in the instruction manual.

8.6. Video Folder Name and File Name Acquisition for MP4 Format

Method : GET

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Recorder ID acquisition	/cgi-bin/get_recorder_num			

For the response data, see the setting side.

8.7. Video Recording Start/End Control

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Video Recording Start/End Control	/cgi-bin/sdctrl	save	start end	start: Recording start end: Recording end

Usage example) Starting video recording to the SD card

<http://192.168.0.10/cgi-bin/sdctrl?save=start>

Usage example) Ending video recording to the SD card

<http://192.168.0.10/cgi-bin/sdctrl?save=end>

- Both recording start and recording end require a few seconds as processing time. Secure some interval time during operation.
- When recording started/stopped correctly, "204 No Content" is issued as the response.
- When, a command such as the recording start command is issued in the state of no SD card inserted, "500 Internal Server Error" is issued as the response. It is also issued as the response if the recording start command is issued while recording is in progress.
- For the query of whether or not recording is in progress, see section 9.1.

9. CGI List for SD Card Status Acquisition and Formatting (Initialization)

9.1. SD Card Relationship Status Acquisition

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
SD card relationship status acquisition	/cgi-bin/get_state			

Usage example) Acquiring SD card relationship status (enabled only in imaging mode, disabled in playback mode and standby)

http://192.168.0.10/cgi-bin/get_state

The description of the response data is as shown below.

Item	Value of response	Description
rec	off,on	on: Video recording in progress
pre_rec	off,on	on: PRE-REC menu is ON
rec_counter	00:00:00	Recording elapsed time
ftp_send	off,on	on: FTP transfer in progress
play	off	(Fixed value)
del_file	off,on	on: Clip (MP4/AVCHD) deletion in progress
download	off,on	on: Clip (MP4/AVCHD) downloading in progress
sd_format	off,on	on: SD card formatting (initialization) in progress
sd_insert	off,on	on: SD card slot 1 is inserted
sd_repair	off,on	on: SD card slot 1 repair in progress
sd_error	off,on	on: SD card slot 1 in error state
sd_rem	*****	SD card slot 1 media remaining amount (unit: Gbyte)
sd_org	*****	SD card slot 1 media capacity (unit: Gbyte)
sd2_insert	off,on	on: SD card slot 2 is inserted
sd2_repair	off,on	on: SD card slot 2 repair in progress
sd2_error	off,on	on: SD card slot 2 in error state
sd2_rem	*****	SD card slot 2 media remaining amount (unit: Gbyte)
sd2_org	*****	SD card slot 2 media capacity (unit: Gbyte)

The recording status and counter information can be acquired by polling this CGI at regular intervals. Leaving a gap of at least 1000 msec between each polling is recommended.

9.2. SD Card Format (Initialization) Control

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
SD card format	/cgi-bin/sdcard	cmd	format	Formatting (initialization) of SD card in slot 1
			format2	Formatting (initialization) of SD card in slot 2

Usage example) Starting formatting (initialization) of SD card in slot 1

<http://192.168.0.10/cgi-bin/sdcard?cmd=format>

- * If you perform formatting during the use of the SD card, "ErrorNo=3" is returned in the main text. You cannot perform formatting in such a case.
- * Depending on the type and state of the card, formatting (initialization) of the SD card may be performed after complete erasure of the SD card. In such a case, a maximum processing time of approximately 120 seconds is required. Issue the next command after confirming completion of formatting with cgi-bin/get_progress.

9.3. SD Card Format (Initialization) Progress Confirmation

Method : GET

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Progress confirmation	/cgi-bin/get_progress	type	format	Acquisition of formatting progress of SD memory card

The response data is as shown below.

progress=xxx

- * Value to be entered in xxx
 - prepare: Preparation in progress
 - exec: Processing in progress
 - finish: Completed
 - cancel: Cancellation in progress
 - error: Termination with an error

10. CGI List for Recorded Clips (MP4/AVCHD)

10.1. Clip (MP4/AVCHD) List Search

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Clip list search of SD card	/cgi-bin/get_clip_list	maxmatches	1 to 15	Upper-limit of number of lists to be acquired * Can be omitted
		index	Numeric value	List search start position 1 to 65535
		device	sd1 sd2	sd1: SD card of slot 1 sd2: SD card of slot 2 Equivalent to sd1 when omitted.
		format	mp4 avchd	mp4: MP4 format avchd: AVCHD format

Usage example) Acquiring AVCHD format list from SD card in slot 2

http://192.168.0.10/cgi-bin/get_clip_list?index=1&device=sd2&format=avchd

The response data is as shown below.

no,filename,mm/dd/yyyy hh:mm:ss,duration[CR][LF]

.
.
.

ClipfileNum = Numeric value (acquired number of lists) [CR][LF]

ClipfileALLNum = Numeric value (total number of files) [CR][LF]

list_id = Numeric value

The response data example is as shown below.

no,filename,mm/dd/yyyy hh:mm:ss,duration
1,S1AA001000000160,06/26/2017 20:12:02,00:00:12
2,S1AA001000000260,06/26/2017 20:13:10,00:00:02
ClipfileNum=2
ClipfileALLNum=2
list_id=5777

Note that mm/dd/yyyy hh:mm:ss and duration indicate the recording start date and time and recording elapsed time of the corresponding clip.

list_id on the last line is a unique value for the acquired file list. It is used for deletion, download, and FTP transfer.

10.2. Clip (MP4/AVCHD) Deletion

Method : GET

Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Deletion of stored data	/cgi-bin/del_clip_file	fileno	Numeric value	File No. acquired by /cgi-bin/get_clip_list * A max. of up to 50 files can be specified.
		list_id	Numeric value	List ID acquired by /cgi-bin/get_clip_list

Usage example) Delete file no. 1 and 2

http://192.168.0.10/cgi-bin/del_clip_file?fileno=1,2&list_id=5777

10.3. Clip (MP4/AVCHD) Download Control

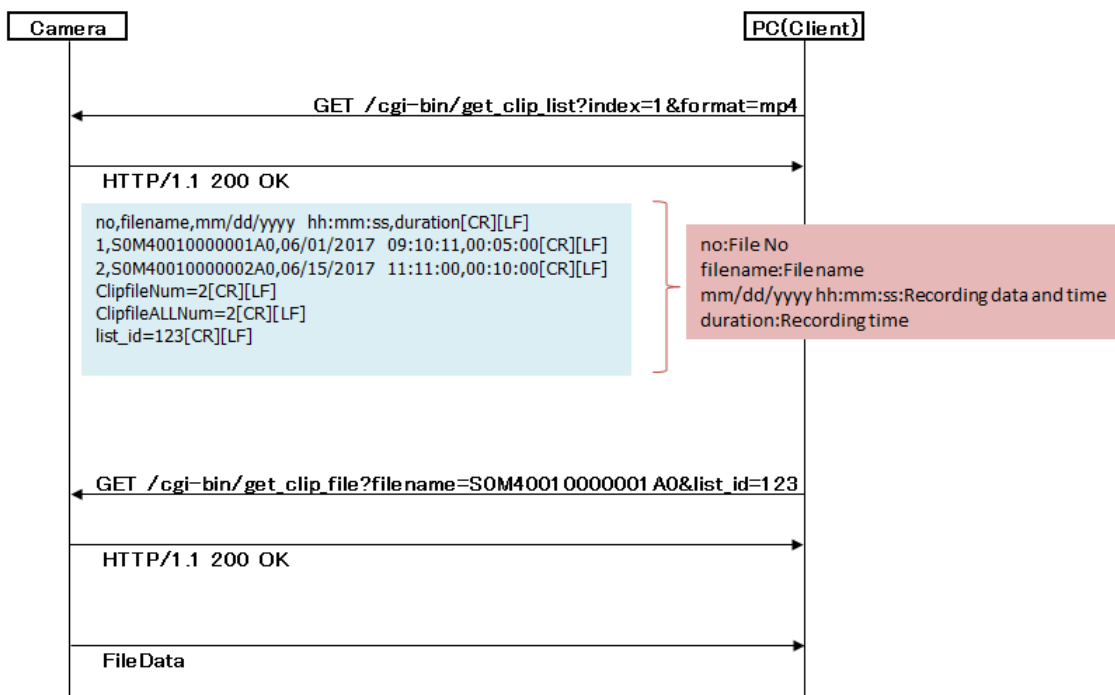
Method : GET
 Access level : Live

CGI item name	URL	Parameter name	Parameter value	Description
Download through file specification	/cgi-bin/get_clip_file	filename	String	File name acquired by /cgi-bin/get_clip_list
		list_id	Numeric value	List ID acquired by /cgi-bin/get_clip_list

Usage example) Download the file 000120150101.

http://192.168.0.10/cgi-bin/get_clip_file?filename=S1AA001000000160&list_id=5799

10.4. Clip (MP4/AVCHD) Download Sequence

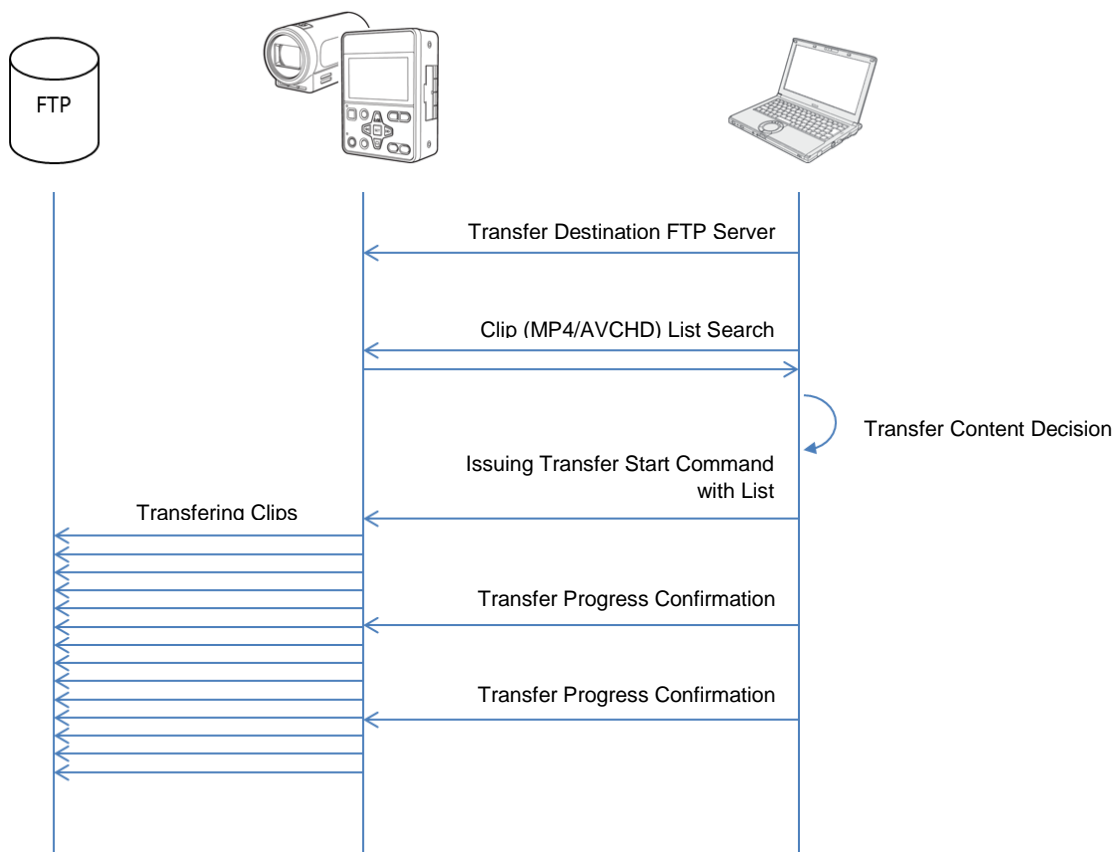


During downloading, a response is issued by assuming the file name (ex. S0M40010000001A0) acquired by /cgi-bin/get_clip_list as the default file name. After completion of the download, it is recommended to rename to the date acquired by /cgi-bin/get_clip_list.

11. CGI List for FTP Control

11.1. FTP Overview

The following shows the relationship between an FTP server and the memory card portable recorder and special optional compact camera head. This document describes the case of using a PC or other device for external control.



- The memory card portable recorder and special optional compact camera head cannot be an FTP server. They are for sending out only.

11.2. Transfer Destination FTP Server Settings

Method : POST

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
FTP server settings	/cgi-bin/set_ftp	server_addr	*.*.* format	*.*.* format
		username	String	String (within 32 single-byte alphanumeric characters)
		password	String	String (within 32 single-byte alphanumeric characters)
		port_num	1 to 65535	1 to 65535
		mode	active passive	active: Active mode passive: Passive mode
		dirname	String	Name of folder to prepare in the user root directory after logging in to the FTP server (string [within 256 characters]) * Characters that can be entered: Double-byte and single-byte symbols (" , & , :) * See section 11.7.

Usage example) Setting FTP server "192.168.0.121." Set ID/PASS of the FTP server as user1/password and the folder as user1_dir.

http://192.168.0.10/cgi-bin/set_ftp?server_addr=192.168.0.121&username=user1&password=password&port_num=21&mode=active&dirname=user1_dir

11.3. FTP Server Information Acquisition

Method : GET

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
FTP server settings information acquisition	/cgi-bin/get_ftp			

The response data is as shown below.

server_addr=*.*.* format
dirname = String
username = String
port_num = Numeric value
mode = active/passive

11.4. Issuing/Canceling Transfer Start Command with List

Method : POST/GET

Access level : Admin

CGI item name	URL	Parameter name	Parameter value	Description
Issuing transfer start command with list	/cgi-bin/send_ftpserver	fileno	Numeric value	File No. acquired by /cgi-bin/get_clip_list * Up to 50 file numbers can be specified When specifying multiple files, separate the File No. with a ",".
		select_type	fileno all	fileno: File No. all: Specify all * When "all" is specified, do not specify the File No. to be transferred.
		list_id	Numeric value	List ID acquired by /cgi-bin/get_clip_list
Cancellation of transfer to FTP server	/cgi-bin/cancel_send_ftpserver			

* cgi-bin/get_clip_list needs to be used. See section 10.1.

Usage example) Transfer File No. 1 by specifying the file no.

http://192.168.0.10/cgi-bin/send_ftpserver?fileno=1&select_type=fileno&list_id=100

Usage example) Transfer File No. 2 and No. 3 by specifying the file no.

http://192.168.0.10/cgi-bin/send_ftpserver?fileno=2,3&select_type=fileno&list_id=100

Usage example) Transfer all files

http://192.168.0.10/cgi-bin/send_ftpserver?select_type=all&list_id=100

Usage example) Cancel transfer

http://192.168.0.10/cgi-bin/cancel_send_ftpserver

11.5. Transfer Progress Confirmation

Method : GET
Access level : Admin

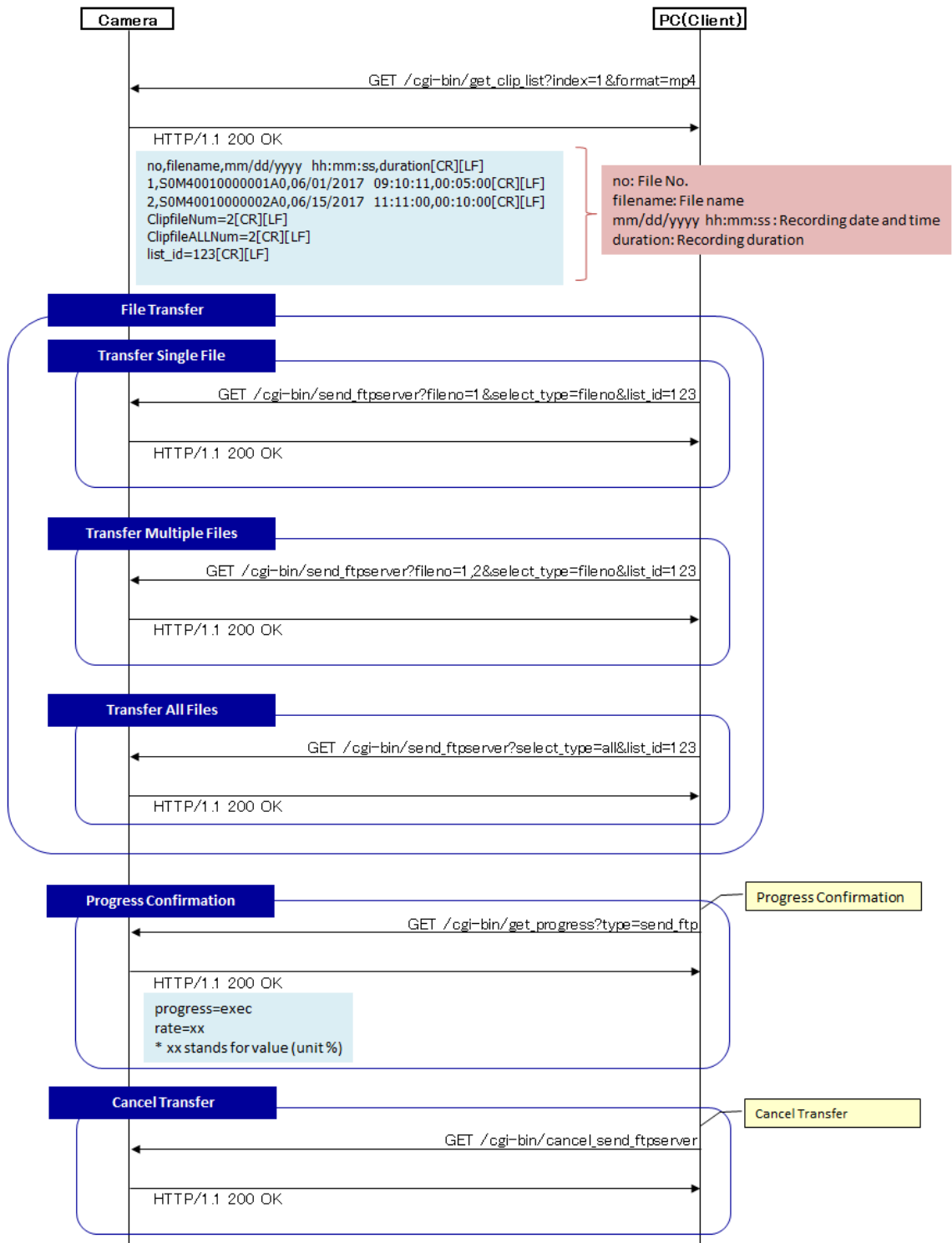
CGI item name	URL	Parameter name	Parameter value	Description
Transfer progress confirmation	/cgi-bin/get_progress	type	send_ftp	Acquisition of progress of FTP server transfer

The response data is as shown below.

progress=xxx
rate = Numeric value (%)

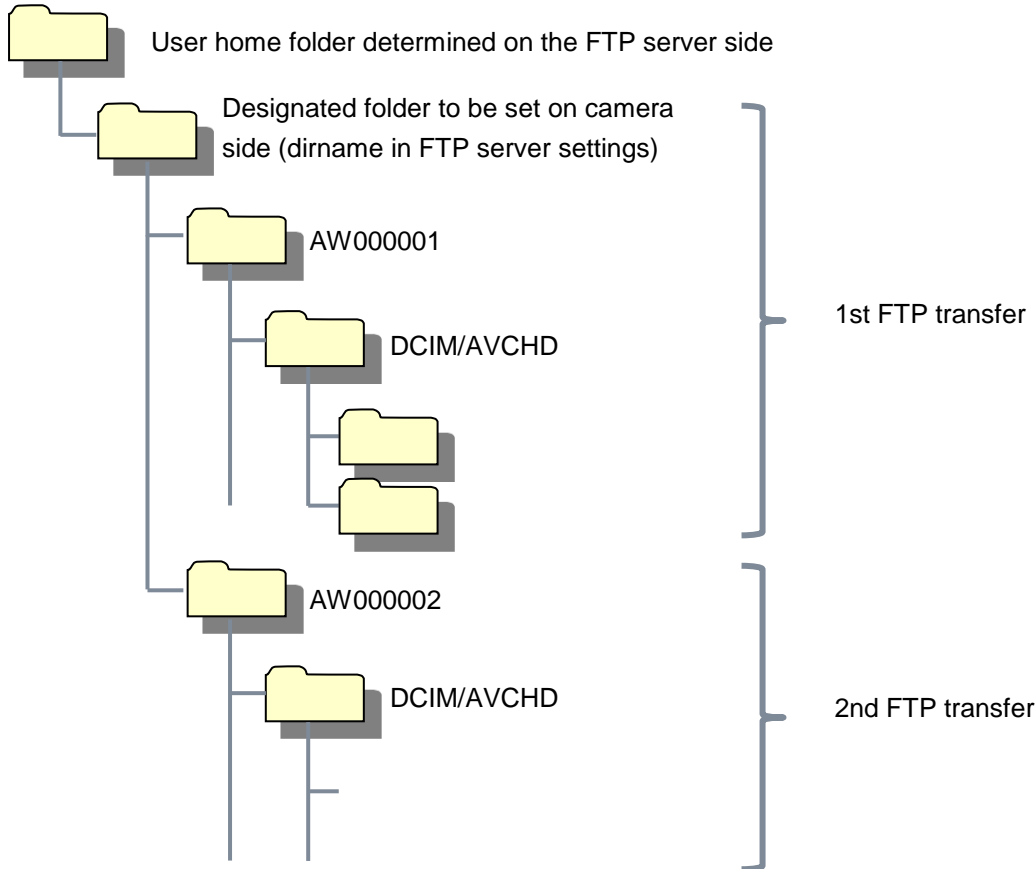
- * Value to be entered in xxx
 - prepare: Preparation in progress
 - exec: Processing in progress
 - finish: Completed
 - cancel: Cancellation in progress
 - error: Termination with an error
- * "rate" indicates the rate of progress.

11.6. FTP Control Sequence



11.7. About Folder Settings at the FTP Server Side

The camera transfers the clip (MP4/AVCHD) files inside the SD card to below the designated folder (dirname in FTP server settings) in the transfer-destination FTP server each time a transfer start command (/cgi-bin/send_ftpserver) is issued to the FTP server.



If the designated folder (dirname in FTP server settings) to be set on the camera side does not exist on the FTP server side, the camera automatically creates a new folder when transfer starts. **

In addition, a sequence number folder starting with "AW" is created under the designated folder, and an SD card folder image starting with DCIM/AVCHD is transferred into that folder.

If a sequence number folder starting with "AW" exists when the transfer begins, a new folder with that numeric value + 1 is created automatically.

Note that if the AW999999 folder exists, FTP transfer cannot be started.

**note

If FTP transfer fails, the designated folder (dirname in FTP server settings) to be set on the camera side may not exist. We recommend creating the folder in advance on the FTP server side.

12. About Control Based on RTSP

The memory card portable recorder and special optional compact camera head support general RTSP protocols as well. This chapter illustrates usage methods based on RTSP. When using such usage methods, you must have knowledge of RTSP/RTP/RTCP.

12.1. About URLs for RTSP Request

The URLs for RTSP requests of the memory card portable recorder and special optional compact camera head are as follows.

Request URL	Description
rtsp://<cam_ip>/mediainput/h264/stream_1	Videos set in WEB menu H264(1) of the camera can be requested.
rtsp://<cam_ip>/mediainput/h264/stream_2	Videos set in WEB menu H264(2) of the camera can be requested.

The RTSP port on the camera (RTSP Server) side is set to 554 in the factory settings. If it needs to be changed, use cgi-bin/set_rtsp (POST command).

The relationship between "H.264 transmission" and "Audio Transmission" in the WEB menu of the memory card portable recorder and special optional compact camera head is as follows.

		Audio Transmission	
		ON	OFF
H.264 transmission	ON	Both video and audio can be used. * As for DESCRIBE, the SDP information of video + audio is issued as response.	Only video can be used. * As for DESCRIBE, only the SDP information of video is issued as response.
	OFF	Both video and audio cannot be used. * As for SETUP, 503 is issued as response.	

When "Audio Transmission" is ON, the camera issues a response by adding audio information to the DESCRIBE information. If necessary, the audio can be transmitted by issuing the SETUP command. On the contrary, if the SETUP command is not issued, only the video can be transmitted. Moreover, if "Audio" in the WEB menu of the camera is "OFF," or nothing is connected to the "Audio IN terminal," it results in transmission without sound.

In this document, descriptions are with "H.264 transmission" and "Audio Transmission" in the ON state.

12.2. About the RTSP Methods

The RTSP methods supported in the camera are as described below.

Supported Method	Description
OPTIONS	Check for the corresponding command
DESCRIBE	Acquisition of session information and Audio support
SETUP	Initialization of the session and mutual exchange of port information
PLAY	Transfer started
PAUSE	Transfer paused * Transmission is stopped, and this method is ignored during multicast.
GET_PARAMETER	Acquisition of session parameter * Operation is performed by assuming Keep Alive.
TEARDOWN	Transfer end/session end

SET_PARAMETER is not supported. 501 is issued as response.

13. About Acquisition of Stream from RTSP

The RTSP communication methods supported in the camera are as described below. No matter which method is used, TCP communication (554 is set as the waiting port at the camera side) is used during initial negotiation of RTSP.

1.UDP Unicast

- Used for transmitting video/audio to a single client in one camera.
- Although transmission to multiple clients is also supported, network bandwidth is needed for each connection.

2. UDP Multicast

- Used for transmitting video/audio simultaneously to multiple clients in one camera.
- The network bandwidth at the camera side does not increase even when transmission is performed to multiple clients.
- A separate router that supports multicast is needed.

3.TCP Unicast

- Used for transmitting video/audio to a single client in one camera.
- The video and audio data communicated via RTP/UDP can be transmitted via TCP.

13.1. UDP Unicast

You must make the settings described below in the WEB menu as preparations at the camera side.

- Set H264(X)/Transmission type to Unicast (AUTO).

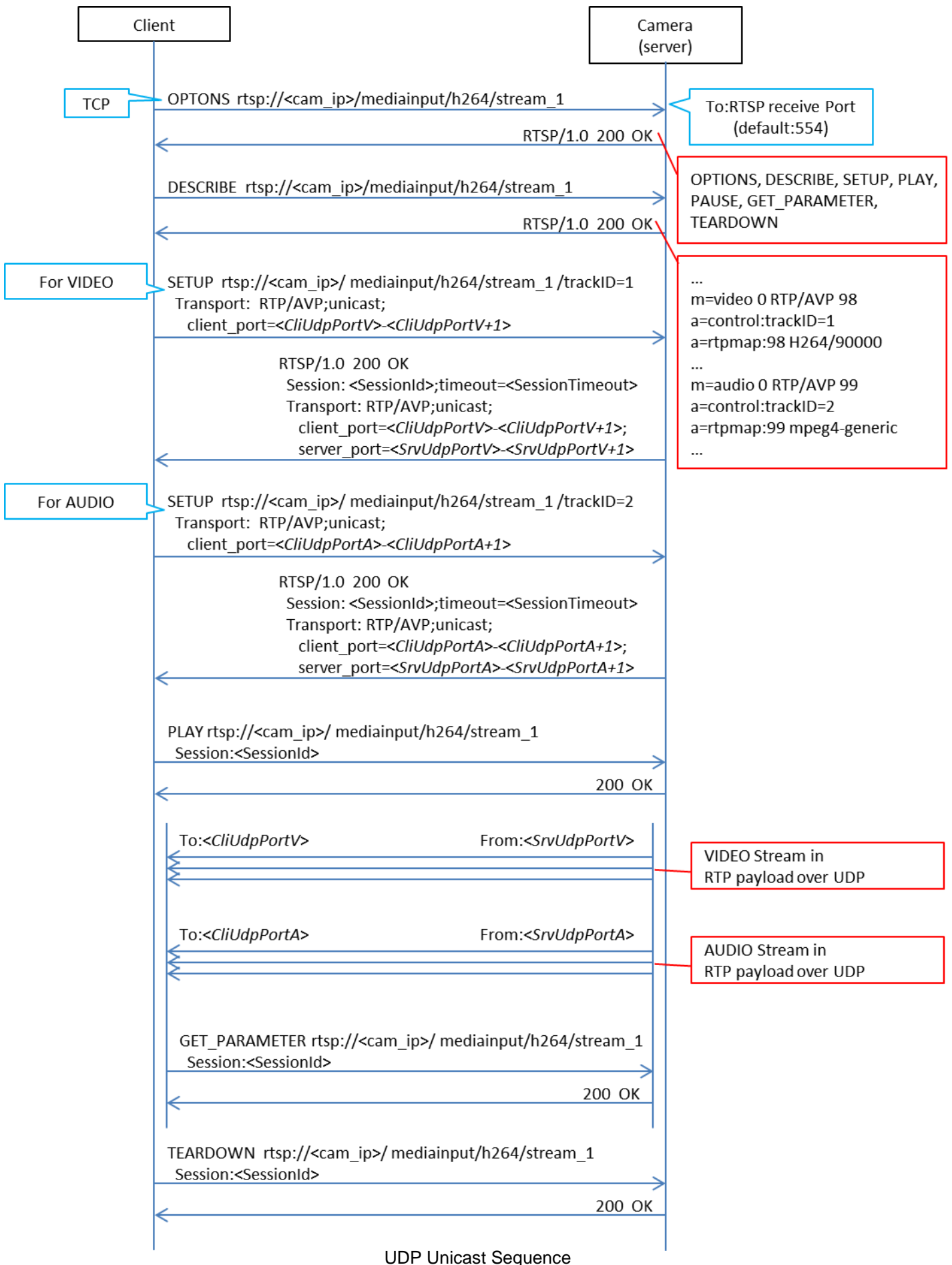
The port number during transmission of video and audio stream is decided as described below.

- client_port (receiving port at the client side):
The client explicitly issues a command to the camera in the RTSP "SETUP" sequence.
* The methods of deciding the port number differ according to the client, and include random settings and dedicated menu.
- server_port (transmitting port of the camera):
The camera responds to the client with a response in the RTSP "SETUP" sequence.
* The port number is decided randomly.

Note that if you want to fix the client_port forcibly, you can do so by making the WEB menu settings described below.

- Set H264(X)/Transmission type to Unicast (MANUAL).
- Set Unicast port (Image)/Unicast port (Audio).
* However, in the RTSP "SETUP" sequence, the content instructed explicitly by the client to the remote camera is ignored, and thus is not used normally.

The acquisition method of video and audio stream by the UDP Unicast method is illustrated below.



```

OPTIONS rtsp://<cam_ip>/mediainput/h264/stream_1 RTSP/1.0
CSeq: 2
User-Agent: <User-Agent>

RTSP/1.0 200 OK
CSeq: 2
Public: OPTIONS, DESCRIBE, SETUP, PLAY, PAUSE, GET_PARAMETER, TEARDOWN

DESCRIBE rtsp://<cam_ip>/mediainput/h264/stream_1 RTSP/1.0
CSeq: 3
User-Agent: <User-Agent>

RTSP/1.0 200 OK
CSeq: 3
Content-Base: rtsp://<cam_ip>/mediainput/h264/stream_1/
Content-Type: application/sdp
Content-Length: <Length>

v=0
o=- 1 1 IN IP4 <cam_ip>
s=Media Presentation
e=NONE
c=IN IP4 0.0.0.0
b=AS:14464
t=0 0
a=control:*
a=range:npt=now-
m=video 0 RTP/AVP 98
b=AS:14336
a=framerate:30.0
a=control:trackID=1
a=rtpmap:98 H264/90000
a=fmtp:98 packetization-mode=1
a=h264-esid:201
m=audio 0 RTP/AVP 99
a=control:trackID=2
a=rtpmap:99 mpeg4-generic/48000/2
a=fmtp:99 streamType=5; profile-level-id=41; mode=AAC-hbr; config=1190; sizeLength=13; indexLength=3;
indexDeltaLength=3; bitrate=128000
a=h264-esid:101

SETUP rtsp://<cam_ip>/mediainput/h264/stream_1/trackID=1 RTSP/1.0
CSeq: 4
User-Agent: <User-Agent>
Transport: RTP/AVP;unicast;client_port=<CliUdpPortV>-<CliUdpPortV+1>

RTSP/1.0 200 OK
CSeq: 4
Session: <SessionId>;timeout=120
Transport: RTP/AVP/UDP;unicast;client_port=<CliUdpPortV>-<CliUdpPortV+1>;
server_port=<SrvUdpPortV>-<SrvUdpPortV+1>;ssrc=<SSRC>

```

UDP Unicast Packets (1/2)

```
SETUP rtsp://<cam_ip>/mediainput/h264/stream_1/trackID=2 RTSP/1.0
CSeq: 5
User-Agent: <User-Agent>
Transport: RTP/AVP;unicast;client_port=<CliUdpPortA>-<CliUdpPortA+1>
Session: <SessionId>

RTSP/1.0 200 OK
CSeq: 5
Session: <SessionId>;timeout=120
Transport: RTP/AVP/UDP;unicast;client_port=<CliUdpPortA>-<CliUdpPortA+1>;
server_port=<SrvUdpPortA>-<SrvUdpPortA+1>;ssrc=<SSRC>

PLAY rtsp://<cam_ip>/mediainput/h264/stream_1/ RTSP/1.0
CSeq: 6
User-Agent: <User-Agent>
Session: <SessionId>
Range: npt=0.000-

RTSP/1.0 200 OK
CSeq: 6
Session: <SessionId>
RTP-Info: url=trackID=1;seq=<SequenceNumber>;rtptime=...
url=trackID=2;seq=<SequenceNumber>;rtptime=...

<VIDEO Stream in RTP payload over UDP>
<AUDIO Stream in RTP payload over UDP>

GET_PARAMETER rtsp://<cam_ip>/mediainput/h264/stream_1/ RTSP/1.0
CSeq: 7
User-Agent: <User-Agent>
Session: <SessionId>

RTSP/1.0 200 OK
CSeq: 7
Session: <SessionId>

TEARDOWN rtsp://<cam_ip>/mediainput/h264/stream_1/ RTSP/1.0
CSeq: 8
User-Agent: <User-Agent>
Session: <SessionId>

RTSP/1.0 200 OK
CSeq: 8
Session: <SessionId>
```

UDP Unicast Packets (2/2)

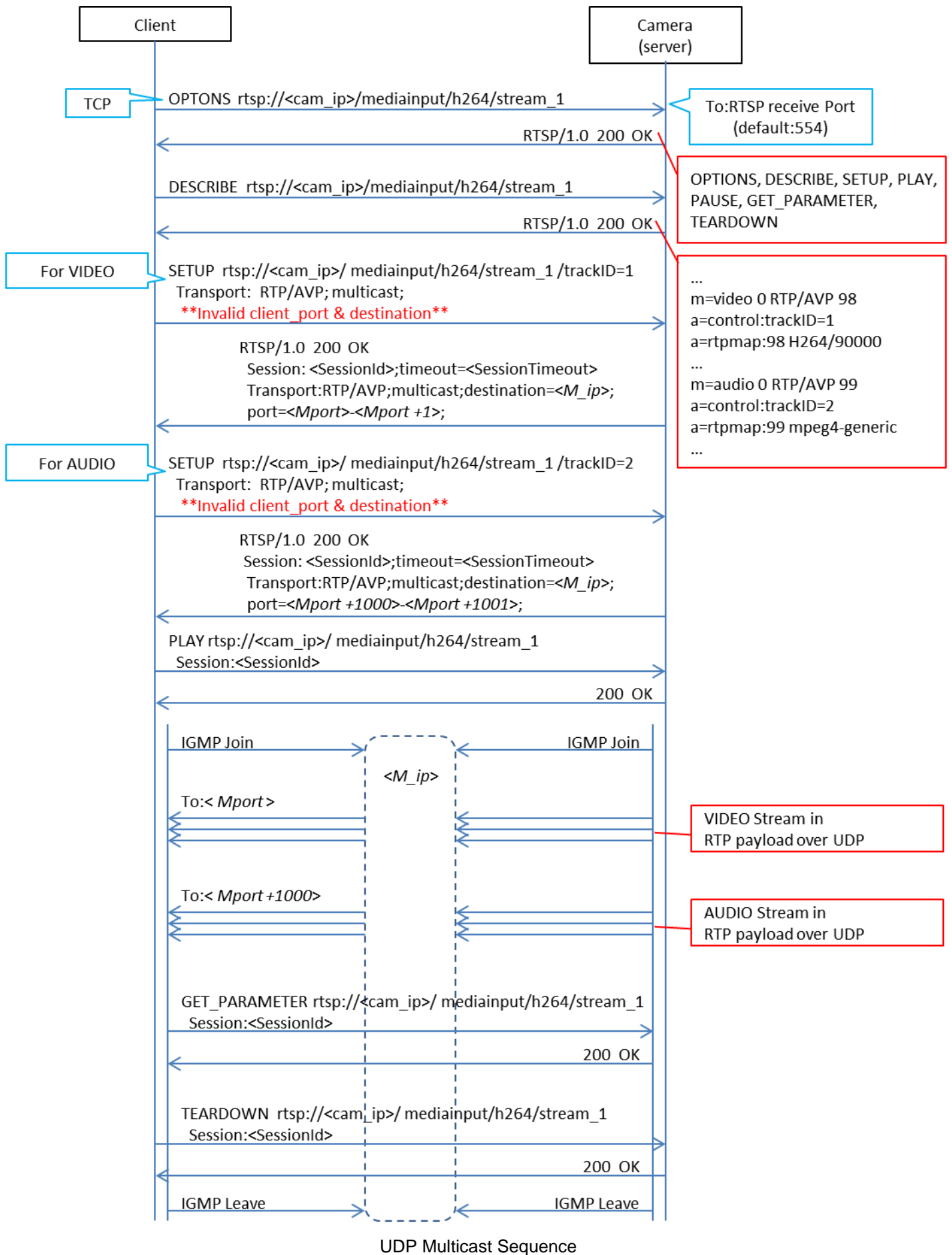
13.2. UDP Multicast

You must make the settings described below in the WEB menu as preparations at the camera side.

- Set H264(X)/Transmission type to Multicast.
- Set H264(X)/Multicast address (set to 239.192.0.20 for H264(1) according to factory settings)
- Set H264(X)/Multicast port (set to 37004 for H264(1) according to factory settings)

The port number and multicast address during transmission of the video and audio stream depend on the values of the WEB menu of the camera, and the commands from the client side are ignored.

The acquisition method of video and audio stream by the UDP Multicast method is illustrated below.



```

OPTIONS rtsp://<cam_ip>/mediainput/h264/stream_1 RTSP/1.0
CSeq: 2
User-Agent: <User-Agent>

RTSP/1.0 200 OK
CSeq: 2
Public: OPTIONS, DESCRIBE, SETUP, PLAY, PAUSE, GET_PARAMETER, TEARDOWN

DESCRIBE rtsp://<cam_ip>/mediainput/h264/stream_1 RTSP/1.0
CSeq: 3
User-Agent: <User-Agent>

RTSP/1.0 200 OK
CSeq: 3
Content-Base: rtsp://<cam_ip>/mediainput/h264/stream_1/
Content-Type: application/sdp
Content-Length: <Length>

v=0
o=- 1 1 IN IP4 <cam_ip>
s=Media Presentation
e=NONE
c=IN IP4 0.0.0.0
b=AS:14464
t=0 0
a=control:*
a=range:npt=now-
m=video 0 RTP/AVP 98
b=AS:14336
a=framerate:30.0
a=control:trackID=1
a=rtpmap:98 H264/90000
a=fmtp:98 packetization-mode=1
a=h264-esid:201
m=audio 0 RTP/AVP 99
a=control:trackID=2
a=rtpmap:99 mpeg4-generic/48000/2
a=fmtp:99 streamType=5; profile-level-id=41; mode=AAC-hbr; config=1190; sizeLength=13; indexLength=3;
indexDeltaLength=3; bitrate=128000
a=h264-esid:101

SETUP rtsp://<cam_ip>/mediainput/h264/stream_1/trackID=1 RTSP/1.0
CSeq: 4
User-Agent: <User-Agent>
Transport: RTP/AVP;multicast;client_port=52944-52945

RTSP/1.0 200 OK
CSeq: 4
Session: <SessionId>;timeout=120
Transport: RTP/AVP/UDP;multicast;destination=<M_ip>;
ttl=16;port=<Mport>-<Mport+1>

```

UDP Multicast Packets (1/2)


```
SETUP rtsp://<cam_ip>/mediainput/h264/stream_1/trackID=2 RTSP/1.0
CSeq: 5
User-Agent: <User-Agent>
Transport: RTP/AVP;multicast;client_port=52946-52947
Session: <SessionId>
```

```
RTSP/1.0 200 OK
CSeq: 5
Session: <SessionId>;timeout=120
Transport: RTP/AVP/UDP;multicast;destination=<M_ip>;
ttl=16;port=<Mport+1000>-<Mport+1001>
```

```
PLAY rtsp://<cam_ip>/mediainput/h264/stream_1/ RTSP/1.0
CSeq: 6
User-Agent: <User-Agent>
Session: <SessionId>
Range: npt=0.000-
```

```
RTSP/1.0 200 OK
CSeq: 6
Session: <SessionId>
RTP-Info: url=trackID=1;seq=<SequenceNumber>;rtptime=...
          url=trackID=2;seq=<SequenceNumber>;rtptime=...
```

```
GET_PARAMETER rtsp://<cam_ip>/mediainput/h264/stream_1/ RTSP/1.0
CSeq: 7
User-Agent: <User-Agent>
Session: <SessionId>
```

```
RTSP/1.0 200 OK
CSeq: 7
Session: <SessionId>
```

UDP Multicast Packets (2/2)

13.3. TCP Unicast

You must make the settings described below in the WEB menu as preparations at the camera side.

- Set H264(X)/Transmission type to Unicast (AUTO).

The port number during transmission of video and audio stream is decided as described below.

- client_port (receiving port at the client side):

The transmission-side port of the client that is used in the RTSP "PLAY" sequence becomes the receiving port at the client side.

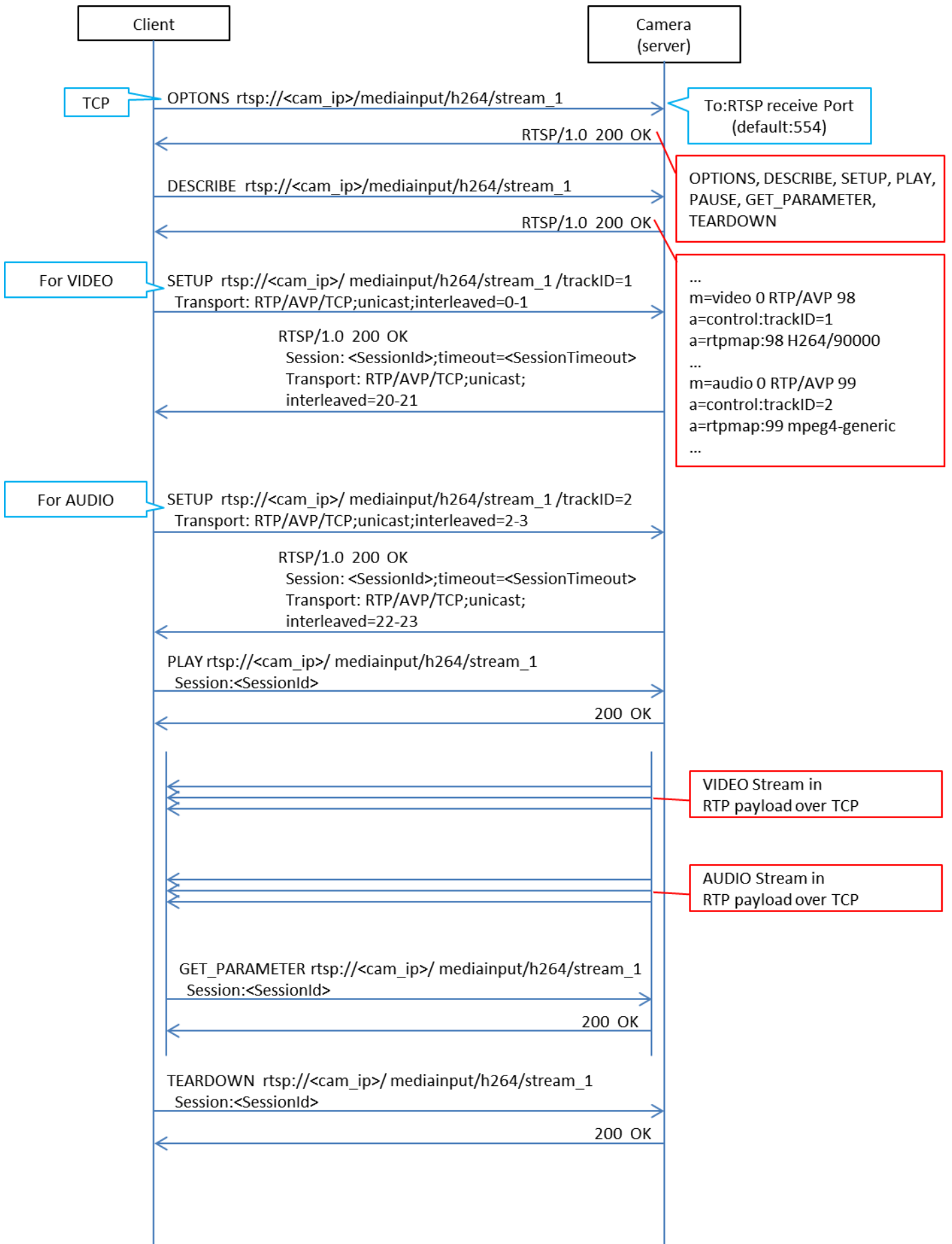
* The methods of deciding the port number differ according to the client, and include random settings and dedicated menu.

- server_port (transmitting port of the camera):

The RTSP waiting port (set to 554 according to factory settings) is used.

The interleave header specified from the client side is ignored at the camera side, and a new interleave header is issued.

The acquisition method of video and audio stream by the TCP Unicast method is illustrated below.



TCP Unicast Sequence

OPTIONS rtsp://<cam_ip>/mediainput/h264/stream_1 RTSP/1.0

CSeq: 2

User-Agent: <User-Agent>

RTSP/1.0 200 OK

CSeq: 2

Public: OPTIONS, DESCRIBE, SETUP, PLAY, PAUSE, GET_PARAMETER, TEARDOWN

DESCRIBE rtsp://<cam_ip>/mediainput/h264/stream_1 RTSP/1.0

CSeq: 3

User-Agent: <User-Agent>

Accept: application/sdp

RTSP/1.0 200 OK

CSeq: 3

Content-Base: rtsp://<cam_ip>/mediainput/h264/stream_1/

Content-Type: application/sdp

Content-Length: <Length>

v=0

o=- 1 1 IN IP4 <cam_ip>

s=Media Presentation

e=NONE

c=IN IP4 0.0.0.0

b=AS:14464

t=0 0

a=control:*

a=range:npt=now-

m=video 0 RTP/AVP 98

b=AS:14336

a=framerate:30.0

a=control:trackID=1

a=rtpmap:98 H264/90000

a=fmtp:98 packetization-mode=1

a=h264-esid:201

m=audio 0 RTP/AVP 99

a=control:trackID=2

a=rtpmap:99 mpeg4-generic/48000/2

a=fmtp:99 streamType=5; profile-level-id=41; mode=AAC-hbr; config=1190; sizeLength=13;

indexLength=3; indexDeltaLength=3; bitrate=128000

a=h264-esid:101

SETUP rtsp://<cam_ip>/mediainput/h264/stream_1/trackID=1 RTSP/1.0

CSeq: 4

User-Agent: <User-Agent>

Transport: RTP/AVP/TCP;unicast;interleaved=0-1

RTSP/1.0 200 OK

CSeq: 4

Session: <SessionId>;timeout=120

Transport: RTP/AVP/TCP;unicast;interleaved=20-21;ssrc=<SSRC>

TCP Unicast Packets 1/2

SETUP rtsp://<cam_ip>/mediainput/h264/stream_1/trackID=2 RTSP/1.0

CSeq: 5

User-Agent: <User-Agent>

Transport: RTP/AVP/TCP;unicast;interleaved=2-3

Session: <SessionId>

RTSP/1.0 200 OK

CSeq: 5

Session: <SessionId>;timeout=120

Transport: RTP/AVP/TCP;unicast;interleaved=22-23;ssrc=<SSRC>

PLAY rtsp://<cam_ip>/mediainput/h264/stream_1/ RTSP/1.0

CSeq: 6

User-Agent: <User-Agent>

Session: <SessionId>

Range: npt=0.000-

RTSP/1.0 200 OK

CSeq: 6

Session: <SessionId>

RTP-Info: url=trackID=1;seq=<SequenceNumber>;rtptime=...

url=trackID=2;seq=<SequenceNumber>;rtptime=...

GET_PARAMETER rtsp://<cam_ip>/mediainput/h264/stream_1/RTSP/1.0

CSeq: 7

User-Agent: <User-Agent>

Session: <SessionId>

RTSP/1.0 200 OK

CSeq: 7

Session: <SessionId>

TCP Unicast Packets 2/2

13.4. About the rtpmap Attribute

The response of "rtpmap" with respect to the RTSP "DESCRIBE" request is as described below.

Codec	rtpmap Attribute Value
H.264	a=rtpmap:98 H264/90000
AAC	a=rtpmap:99 mpeg4-generic/48000/2

The values described above are used for both video and audio regardless of the bit rate.

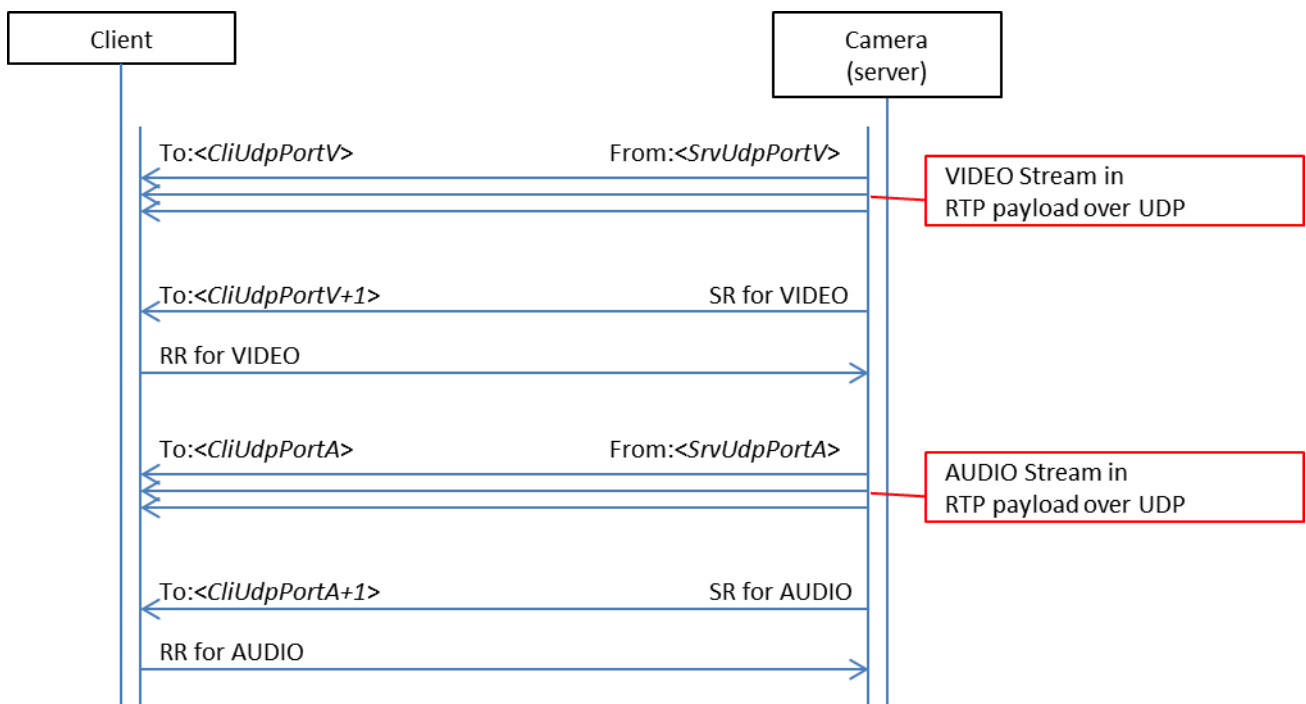
14. About Control Based on RTCP

The camera also supports dynamic control of bit rate and frame rate according to the line status using RTCP. As a prerequisite, a client that supports RTCP/SR (Sender Report) and RTCP/RR (Receiver Report) is necessary.

You must make the settings described below in the WEB menu as preparations at the camera side.

- Set H264(X)/Transmission priority to Best effort.
 - * In the case of the frame rate (factory settings) and constant bit rate, an RTCP/SR is transmitted and an RTCP/RR is received, but these are not used for controlling the bit rate and frame rate.
- Select H264(X)/Image quality from Motion priority or Image quality priority.
 - Motion priority: This is the motion priority mode. The bit rate is actively changed and supported.
 - Image quality priority: This is the image quality priority mode. The frame rate is actively changed.

The sequence during RTCP control is illustrated below:



Note that in the camera, an RTCP/SR is transmitted every five seconds, and of the RTCP/RRs, only those related to VIDEO are used.

15. About RTP/Data Format

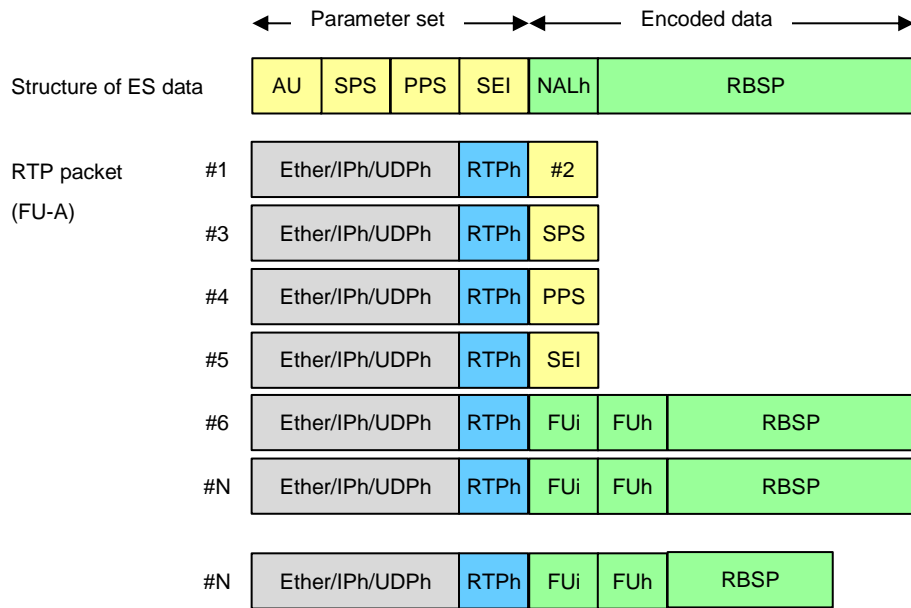
15.1. RTP Header Format

Byte	0.				8.		16.		24.	
	2	1	1	4	1	7	8		8	
0	V	P	X	CC	M	PT		Sequence number		
4	Timestamp									
8	SSRC (Synchronization Source Identifier)									
12	Defined by profile						Extension length			
16	Additional Information (1)									
	Additional Information (N)									

Parameter name	length(Bit)	Values and comments
V (Version)	2	2 (fixed)
P (Padding)	1	0 (fixed)
X (Extension)	1	0: false , 1: true
CC (CSRC Count)	4	0 (fixed)
M (Marker)	1	In case of the last RTP packet of a picture, this value is set to 1
PT (Payload Type)	7	98 (fixed for H.264) 99 (fixed for AAC)
Sequence number	16	The value in which one increment is done in each RTP packet is set. An initial value is generated at random.
Timestamp	32	Time stamp
SSRC	32	0x0000 0000 (fixed)
CSRC	0	Unused
Defined by profile(*)	16	0 (fixed)
Extension length(*)	16	Length of the Header Extension (Unit of 32bit word)
meta information (Additional Information) (*)		

15.2. Relationship with H.264/ES Data

The structure of ES data and RTP packet of H.264 is as shown below.



[Notes]

NALh	:NAL header	(1Byte)
Fui	:FU identifier	(1Byte)
Fuh	:FU header	(1Byte)
Ether/IPh/UDPh	:Ether/IP header/UDP header	
RTP	:RTP header	

15.3. H.264 Syntax

In the camera, the Codec information to be used changes depending on the resolution/frame rate. The following information is used when 59.94 Hz is set.

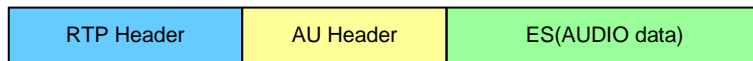
Resolution / Frame rate	Codec Info
640x360/5p,15p,30p 1280x720/5p,15p,30p,60p 1920x1080/5p,15p,30p	H.264/High profile (no B frame/CAVLC) GOP interval approx 1 sec.
1920x1080/60p	H.264/High profile (no B frame/CABAC) GOP interval approx 1 sec.
3840x2160/5p,15p	H.264/High profile (no B frame/CABAC) GOP interval approx 0.5 sec.
3840x2160/30p	H.264/High profile (B frame present/CABAC) GOP interval approx 0.5 sec.

15.4. Audio Data Format

The structure of the audio ES data and RTP packet differs depending on the audio compression method.

When the audio compression method is AAC:

An AU header (2 bytes) is inserted between the RTP header and audio data, and then transmitted.



Memo: