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HD Integrated Camera
Interface Specifications
AW-HE2 Series

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1. Introduction

This manual describes the external interface specifications which are applicable when the HD integrated camera is operated using Ethernet.

It consists of three main sections, namely, camera and System control, camera information update notifications and error return.

Applicable models

- AW-HE2 series

2. Configuration outline

This manual has the following general configuration.

1. Camera and System control

It is possible to control the Digital pan, Digital tilt and white balance adjustments.

The various functions are employed for the operations with the camera using HTTP which is the host protocol of TCP.

For further details, refer to chapter 3.

2. Camera information update notification

The local terminal is notified of the values of the gain and other settings which have been changed at another terminal or other terminals so that it can acquire the camera information.

This feature is useful when one camera is controlled by a multiple number of terminals, and when the setting for enabling update notifications to be received has been established, the information which has been changed by other terminals can be acquired.

For further details, refer to chapter 4.

3. Camera information batch acquisition

The camera information can be acquired in batch form. Since there is no need to query each and every camera information item when this feature is used, the feature is useful when all the camera information is required such as at startup.

For further details, refer to chapter 5.

4. Error return

An error — whether ER1, ER2 or ER3 — is returned when an error has been generated by a command in 1 above or when the AWB result contains an error.

For further details, refer to chapter 6.

3. Camera and System control

Given below are the external interfaces which are used when operating the camera using Ethernet. This chapter presents the following details.

1. System control

This interface controls the pan-tilt head, and it uses the “System control commands”.

2. Camera control

This interface is concerned with the camera’s lens control and image adjustments, and it uses the “camera control commands”.

3.1. System control

The System control commands are in compliance with the HTTP1.1 communication specifications. Their format is given below.

For details on the HTTP messages, refer to <Appendix>.

【Command format】

[Send]

http://[**IP Address**]/cgi-bin/aw_ptz?cmd=[**Command**]&res=[**Type**]

where

※**IP Address**…… IP address of camera at connection destination

※**Command**…… Details given in “Command” column in the command tables below

※**Type**…… Fixed at “1”

[Receive]

200 OK “**Command**”

※**Command**…… Response value of each command; set in the HTTP message body

Example: Pan/tilt (Stop)

[Send]

http://192.168.0.10/cgi-bin/aw_ptz?cmd=#PTS5050&res=1

[Receive]

200 OK “**pTS5050**”

*Depending on the browser or middleware used, “#” may have to be converted to “%23” by ASCII conversion.

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23PTS5050&res=1

Given below is the communication sequence which accords with the command format presented on the previous page.

For the communication sequence of the errors generated in response to commands which have been sent, refer to “6. Error return”.

【Sequence】

“PC1” is the control terminal in the sequence below.

Example: Pan/tilt (Stop) control

Camera IP Address = 192.168.0.10

Command = PTS5050

The control to stop the pan-tilt operation is exercised from PC1. [200 OK “pTS5050”] is returned as the response from the camera.

The control command and query command are available as the System control commands.

Given below is the command sequence.



Fig.3.1-1 Command sequence of System control

It must be borne in mind that communication with the camera is subject to some restrictions. These restrictions are as follows.

【Restrictions】

1. When using the System control commands, send the commands with a gap of 130 ms between each command. Given below is the sequence.

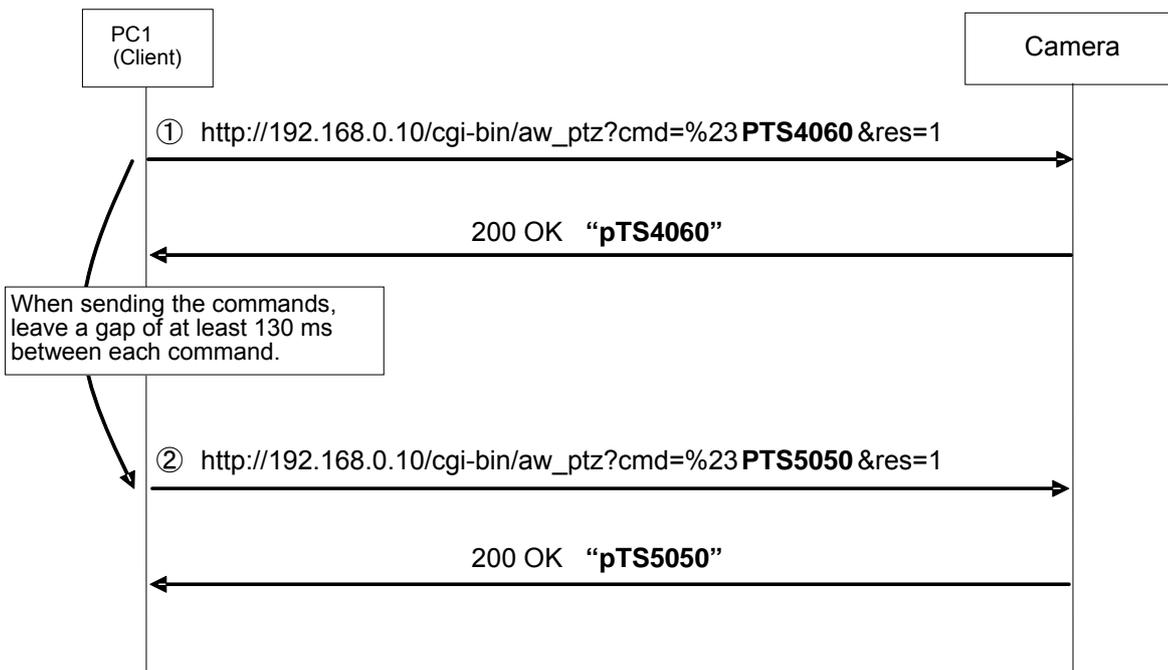


Fig.3.1-2 Restrictions

2. The number of sessions during which the camera can be accessed simultaneously is as follows.
 - a) Maximum number of HTTP sessions: 72
 - b) Number of terminals which can receive update notifications at the same time: 5
When the AW-RP50 is connected, it is counted as one unit.
3. Keep-Alive cannot be set with HTTP connections.
Connect and disconnect are performed each time a command is sent or received.
4. Some settings and conditions may restrict the effects of other settings (※including those with exclusive control conditions). See also the operating instructions which are provided with the products.
5. Send the commands which change the settings only at the point in time when the changes are required. (Do not send them at regular intervals.)

3.1.1. Power On/Standby

These commands enable the power On/Standby of the camera to be controlled and the current power On/Standby statuses to be acquired.

Table 3.1.1 Power On/Standby

Command name	Category	Command	Data value	Setting	Remarks
Power On/ Standby control command	Control	#O[Data]	0 1	Standby Power On	
	Response	p[Data]			
Power On/ Standby query command	Request	#O	None		
	Response	p[Data]	0 1	Standby Power On	

Example of use) Power On

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23O1&res=1

[Response] AW-HE2 → PC

200 OK "p1"

3.1.2. Installation commands

These commands control the method used for the installation of the camera.

Only "Desktop" response is supported in AW-HE2 series.

Table 3.1.2 Installation commands

Command name	Category	Command	Data value	Setting	Remarks
Installation position query command	Request	#INS	None		
	Response	iNS[Data]	0	Desktop	

Example of use)

• Installation position query command

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23INS&res=1

[Response] AW-HE2 → PC

200 OK "iNS0"

3.1.3. Pan/tilt

These commands enable the pan and tilt of the camera to be controlled.

Table 3.1.3 Pan/tilt

Command name	Category	Command	Data value	Setting	Remarks
Pan/tilt position control command	Control	#APC[Data1] [Data2]	[Data1] 8000 [Data2] 8000	center center	• The pan-tilt head moved to the home position by #APC[8000][8000].
	Response	aPC[Data1] [Data2]			
Speed (pan/tilt) control command	Control	#P[Data]	01~07 18~33 34~49 50 51~66 67~82 83~99	Left Max. Speed Left Mid. Speed Left Min. Speed Pan Stop Right Min. Speed Right Mid. Speed Right Max. Speed	Pan speed to be controlled
	Response	pS[Data]			
	Control	#T[Data]	01~07 18~33 34~49 50 51~66 67~82 83~99	Down Max. Speed Down Mid. Speed Down Min. Speed Tilt Stop UP Min. Speed UP Mid. Speed UP Max. Speed	Tilt speed to be controlled
	Response	tS[Data]			
Speed (pan/tilt) control command	Control	#PTS[Data1] [Data2]	[Data1] 01~07 18~33 34~49 50 51~66 67~82 83~99 [Data2] 01~07 18~33 34~49 50 51~66 67~82 83~99	[Data1] Left Max. Speed Left Mid. Speed Left Min. Speed Pan Stop Right Min. Speed Right Mid. Speed Right Max. Speed [Data2] [Data2] Down Max. Speed Down Mid. Speed Down Min. Speed Tilt Stop UP Min. Speed UP Mid. Speed UP Max. Speed	[Data1] Pan speed control [Data2] Tilt speed control
	Response	pTS[Data1] [Data2]			

Example of use)

•Pan speed control: max. speed to the right

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23P99&res=1

[Response] AW-HE2 → PC

200 OK "pS99"

3.1.4. Lens operations (Zoom & Iris)

3.1.4.1. Zoom

These commands control the zooming (between Wide and Tele) of the camera lens.

Table 3.1.4.1 Zoom

Command name	Category	Command	Data value	Setting	Remarks
Zoom (position control) control command	Control	#AXZ[Data]	555	Wide	AW-HE2 Only support "555"
	Response	axz[Data]			
Zoom (speed control) control command	Control	#Z[Data]	01~25 26~49 50 51~74 75~99	Wide Max. Speed Wide Min. Speed Zoom Stop Tele Min. Speed Tele Max. Speed	Zooming speed to be controlled
	Response	zS[Data]			

Example of use)

- Moves to Wide

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23AXZ555&res=1

[Response] AW-HE2 → PC

200 OK "axz555"

- Speed control: zooming max. speed in Wide direction

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23Z01&res=1

[Response] AW-HE2 → PC

200 OK "zS01"

3.1.4.2. Iris

These commands control the iris (between Close and Open) of the camera and enable the current iris position to be acquired.

In addition, they enable Auto/Manual control of the iris and the current iris Auto/Manual statuses to be acquired.

Commands which control the iris are also described in section 3.2.1 .

Table 3.1.4.2 Iris

Command name	Category	Command	Data value	Setting	Remarks
Iris position control command	Control	#AXI [Data]	555 FFF	Iris Close Iris Open	
	Response	axi [Data]			
Iris position Auto/Manual query command	Request	#GI	None	Iris Close Iris Open	
	Response	gi [Data1] [Data2]	[Data1] 555 ? FFF [Data2] 0 1		
Auto Iris On/Off control command	Control	#D3[Data]	0 1	Manual Iris Auto Iris	
	Response	d3[Data]			
Auto Iris On/Off query command	Request	#D3	None	Manual Iris Auto Iris	
	Response	d3[Data]	0 1		

Example of use)

• Iris: Close

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23AXI555&res=1

[Response] AW-HE2 → PC

200 OK "axi555"

• Auto iris: On

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23D31&res=1

[Response] AW-HE2 → PC

200 OK "d31"

3.1.5. Lens information notification

These commands enable On or Off to be set for the lens information notification of the camera and the current lens information notification On/Off status and lens information to be acquired.

Table 3.1.5 Lens information notification On/Off

Command name	Category	Command	Data value	Setting	Remarks
Lens information notification On/Off control command	Control	#LPC[Data]	0 1	Off On	Off: Information is not posted. On: Information is posted.
	Response	IPC[Data]			
Lens information notification On/Off query command	Request	#LPC	None		
	Response	IPC[Data]	0 1	Off On	

Example of use)

•Lens information notification: On

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23LPC1&res=1

[Response] AW-HE2 → PC

200 OK "IPC1"

3.1.6. Preset

These commands register and play back the presets of the camera and enable the preset number last played back to be acquired.

Table 3.1.6 Preset

Command name	Category	Command	Data value	Setting	Remarks
Preset (register) control command	Control	#M[Data]	00 ~ 08	Preset 001 } Preset 009	
	Response	s[Data]			
Preset (playback) control command	Control	#R[Data]	00 ~ 08	Preset 001 } Preset 009	
	Response	s[Data]			
Preset number query command	Request	#S	None		Request for preset number last played back
	Response	s[Data]	00 ~ 08	Preset 001 } Preset 009	
Preset (delete) control command	Control	#C[Data]	00 ~ 08	Preset 001 } Preset 009	
	Response	s[Data]			

※After the presets have all been played back, the completion notification is sent in the “q**” format.
For details, refer to “4.4.3. Preset playback”.

Example of use)

- Preset: registering a setting in Preset 08

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23M07&res=1

[Response] AW-HE2 → PC

200 OK “s07”

- Preset: playing back Preset 2

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23R01&res=1

[Response] AW-HE2 → PC

200 OK “s01”

3.1.7. Tally

These commands exercise enable/disable control over the tally input of the camera and enable the current tally input enable/disable statuses to be acquired.

In addition, they exercise tally On/Off control over the camera.

Table 3.1.7 Tally

Command name	Category	Command	Data value	Setting	Remarks
Tally input enable/disable control command	Control	#TAE[Data]	0 1	Disable Enable	
	Response	tAE[Data]			
Tally input enable/disable query command	Request	#TAE	None		
	Response	tAE[Data]	0 1	Disable Enable	
Tally On/Off control command	Control	#DA[Data]	0 1	Tally Off Tally On	
	Response	dA[Data]			
Tally On/Off query command	Request	#DA	None		
	Response	dA[Data]	0 1	Tally Off Tally On	

Example of use)

• Tally: On

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23DA1&res=1

[Response] AW-HE2 → PC

200 OK "dA1"

3.1.8. Wireless remote controller setting

These commands make it possible for enable or disable to be set for the control which is exercised over the wireless remote controller of the camera and for the current enable/disable statuses to be acquired.

Table 3.1.8 Wireless remote controller enable/disable setting

Command name	Category	Command	Data value	Setting	Remarks
Wireless remote controller control enable/disable control command	Control	#WLC[Data]	0 1	Disable Enable	
	Response	wLC[Data]			
Wireless remote controller control enable/disable query command	Request	#WLC	None		
	Response	wLC[Data]	0 1	Disable Enable	

Example of use) Wireless remote controller: Disable

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23WLC0&res=1

[Response] AW-HE2 → PC

200 OK "wLC0"

3.2. Camera control

The camera control commands are based on the HTTP1.1 communication specifications. Their format is given below. For details on the HTTP messages, refer to <Appendix>.

【Command format】

[Send]

http://[IP Address]/cgi-bin/aw_cam?cmd=[Command]&res=[Type]

※**IP Address** IP address of camera at connection destination

※**Command** Details given in “Command” column in the command tables below

※**Type** Normally “1” (but “0” for the AWB[OWS] and ABB[OAS] commands)

[Receive]

200 OK “**Command**”

※**Command** Response value of each command; described in the HTTP message body.

There is no response in the case of an AWB or ABB command whose Type is 0.

Refer to “4. Camera information update notification” in order to receive the AWB/ABB result notifications.

Example: Focus setting = Auto

[Send]

http://192.168.0.10/cgi-bin/aw_cam?cmd=OAF:0&res=1

[Receive] The response is the HTTP response.

200 OK “**OAF:0**”

Given below is the sequence used when communication has been performed in accordance with the command format described on the previous page.

For the sequence when errors have been generated in response to commands, refer to “6. Error return”.

【Sequence】

“PC1” is the control terminal in the sequence below.

Example: Focus setting = Auto

Camera IP Address = 192.168.0.10

Command = OAF:1

Auto focus control is performed from PC1, and [200 OK “OAF:1”] is returned as the response.

Both a control command and query command are available as the camera control commands.

Given below is the command sequence.

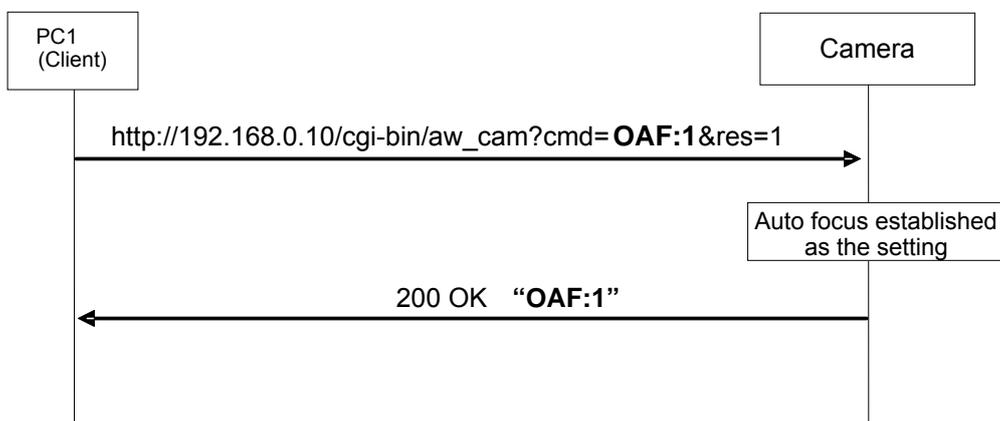


Fig. 3.2-1 Camera control command sequence

The following restrictions should be noted when using these commands.
 These restrictions are as follows.

【Restrictions】

1. When sending the camera control commands, send the commands with a gap of 130 ms between each command.
 Given below is the command sequence.

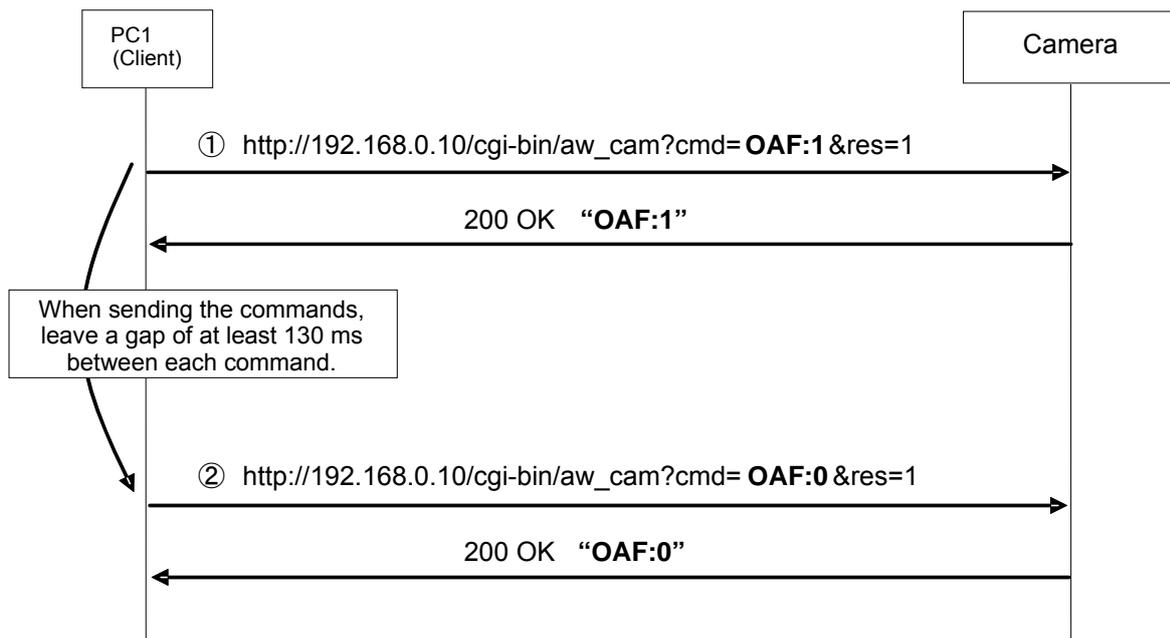


Fig.3.2-2 Restrictions

2. Send the commands which change the settings only at the point in time when the changes are required. (Do not send them at regular intervals.)

3.2.1. Iris

These commands control the iris (between Close and Open) of the camera and enable the current iris position to be acquired.

They also enable iris Auto/Manual to be controlled, the iris Auto/Manual status to be checked and the 10 steps of the contrast level to be set and these settings to be checked.

Commands which control the iris are also described in section 3.1.4.2 Iris

Table 3.2.1 Iris

Command name	Category	Command	Data value	Setting	Remarks
Iris Auto/Manual control command	Control	ORS:[Data]	0 1	Manual Auto	• This command restores the held manual iris setting when control is switched from Auto to Manual.
	Response	ORS:[Data]			
Iris Auto/Manual query command	Request	QRS	None		
	Response	ORS:[Data]	0 1	Manual Auto	
Contrast level Picture level control command	Control	OSD:48:[Data]	64 5A~63 50~59 46~4F 3C~45 32~3B 28~31 1B~27 14~1A 0A~13 00~09	+5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5	
	Response	OSD:48:[Data]			
Contrast level Picture level query command	Request	QSD:48	None		Contrast level
	Response	OSD:48:[Data]	64 5A~63 50~59 46~4F 3C~45 32~3B 28~31 1B~27 14~1A 0A~13 00~09	+5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5	

Example of use)

•Auto iris: On

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=ORS:1&res=1

[Response] AW-HE2 → PC

200 OK "ORS:1"

3.2.2. Color Bars setting

These commands enable color bar/camera to be switched, the color bar setup to be set and the current settings to be acquired.

Table 3.2.2 Color Bars

Command name	Category	Command	Data value	Setting	Remarks
Color bar/Camera control command	Control	DGB:[Data]	0 1	Camera Color Bars	
	Response	DGB:[Data]			
Color bar/Camera query command	Request	QBR	None		
	Response	OBR:[Data]	0 1	Camera Color Bars	

Example of use)

- Color bar/Camera control: Color bar

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=DGB:1&res=1

[Response] AW-HE2 → PC

200 OK "DGB:1"

3.2.3. Chroma level setting

These commands enable the chroma level of the camera to be set and the current settings to be acquired.

Table 3.2.3 Chroma level setting

Command name	Category	Command	Data value	Setting	Remarks
Chroma level control command	Control	OCG:[Data]	00 01 02 03 04 05 06	-5 -3 -1 0 +1 +3 +5	
	Response	OCG:[Data]			
Chroma level query command	Request	QCG	None		
	Response	OCG:[Data]	00 01 02 03 04 05 06	-5 -3 -1 0 +1 +3 +5	

Example of use)

- Chroma level: 0

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=OCG:03&res=1

[Response] AW-HE2 → PC

200 OK "OCG:03"

3.2.4. AWB/ABB setting

These commands select the AWB mode of the camera, execute AWB/ABB and enable the current AWB mode status to be acquired.

Table 3.2.4 AWB/ABB setting

Command name	Category	Command	Data value	Setting	Remarks
AWB (AWC) execution control command	Control	OWS	None		AWB (AWC) is executed.
	Notification	OWS ER3:OWS		AWC/AWB OK AWC/AWB NG	<ul style="list-style-type: none"> There is no response which supports this control command. Notification is given by the separate update notification function. For details, refer to "4. Camera information update notification".
AWB execution underway status display On/Off control command	Control	OSA:88:[Data]	0 1	Off On	<ul style="list-style-type: none"> On or Off for screen display of AWB OK/NG.
	Response	OSA:88:[Data]			
AWB execution underway status display On/Off query command	Request	QSA:88	None		
	Response	OSA:88:[Data]	0 1	Off On	
AWB (AWC) Mode control command	Control	OAW:[Data]	0 1 2 3 4 5 6 7 8	ATW AWB A AWB B ATW 3200K 5600K 4500K 6000K 2800K	
	Response	OAW:[Data]			
AWB (AWC) Mode query command	Request	QAW	None		
	Response	OAW:[Data]	0 1 2 3 4 5 6 7 8	ATW AWB A AWB B ATW 3200K 5600K 4500K 6000K 2800K	
ABB (ABC) execution control command	Control	OAS	None		ABB (ABC) is executed.
	Notification	OAS		ABB(ABC) OK	This function does not exist in AW-HE2 series. However, the response always is "OK".

Example of use)

•AWB (AWC) execution

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=OWS&res=0

[Response] AW-HE2 → PC

None

3.2.5. Flesh Tone Mode setting

These commands control the flesh tone mode of the camera and enable the current settings to be acquired.

Table 3.2.5 Flesh Tone Mode setting

Command name	Category	Command	Data value	Setting	Remarks
Flesh Tone Mode control command	Control	OSE:32:[Data]	0 1	Off On	
	Response	OSE:32:[Data]			
Flesh Tone Mode query command	Request	QSE:32	None		
	Response	OSE:32:[Data]	0 1	Off On	

Example of use) Flesh Tone Mode: On

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=OSE:32:1&res=1

[Response] AW-HE2 → PC

200 OK "OSE:32:1"

3.2.6. DRS setting

These commands control the DRS of the camera and enable the current settings to be acquired.

Table 3.2.6 DRS setting

Command name	Category	Command	Data value	Setting	Remarks
DRS control command	Control	OSE:33:[Data]	0 1	Off On	
	Response	OSE:33:[Data]			
DRS query command	Request	QSE:33	None		
	Response	OSE:33:[Data]	0 1	Off On	

Example of use)

•DRS: Off

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=OSE:33:0&res=1

[Response] AW-HE2 → PC

200 OK "OSE:33:0"

3.2.7. Backlight compensation setting

These commands exercise On/Off control over the backlight compensation of the camera and enable the current settings to be acquired.

Table 3.2.7 Backlight compensation setting

Command name	Category	Command	Data value	Setting	Remarks
Backlight compensation control command	Control	OSE:73:[Data]	0 1	Off On	
	Response	OSE:73:[Data]			
Backlight compensation query command	Request	QSE:73	None		
	Response	OSE:73:[Data]	0 1	Off On	

Example of use)

•Backlight compensation: Off

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=OSE:73:0&res=1

[Response] AW-HE2 → PC

200 OK "OSE:73:0"

3.2.8. Output setting

These commands control the output settings of the camera and enable the current settings to be acquired. The setting items include format and down-conversion mode.

Table 3.2.8 Output setting

Command name	Category	Command	Data value	Setting	Remarks
Format control command	Control	OSA:87:[Data]	01 02 04 05 10 11 12 13	720/59.94p(59.94Hz) 720/50p(50Hz) 1080/59.94i(59.94Hz) 1080/50i(50Hz) 1080/59.94p(59.94Hz) 1080/50p(50Hz) 480/59.94p(59.94Hz) 576/50p(50Hz)	Data values with different field frequencies are invalid (ER3 is returned).
	Response	OSA:87:[Data]			
Format query command	Request	QSA:87	None		
	Response	OSA:87:[Data]	01 02 04 05 10 11 12 13	720/59.94p(59.94Hz) 720/50p(50Hz) 1080/59.94i(59.94Hz) 1080/50i(50Hz) 1080/59.94p(59.94Hz) 1080/50p(50Hz) 480/59.94p(59.94Hz) 576/50p(50Hz)	
Down-conversion mode control command	Control	OSE:20:[Data]	0 1 2	SideCut Squeeze LetterBOX	
	Response	OSE:20:[Data]			
Down-conversion mode query command	Request	QSE:20	None		
	Response	OSE:20:[Data]	0 1 2	SideCut Squeeze LetterBOX	

Example of use)

•Format: 720/59.94p

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=OSA:87:01&res=1

[Response] AW-HE2 → PC

200 OK "OSA:87:01"

•Down-conversion mode: Squeeze

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=OSE:20:1&res=1

[Response] AW-HE2 → PC

200 OK "OSE:20:1"

3.2.9. Digital zoom settings

These commands control the digital zoom of the camera.

Table 3.2.9 Digital zoom settings

Command name	Category	Command	Data value	Setting	Remarks
Digital zoom On/Off control command	Control	OSE:70:[Data]	0 1	Disable Enable	
	Response	OSE:70:[Data]			
Digital zoom On/Off query command	Request	QSE:70	None		
	Response	OSE:70:[Data]	0 1	Disable Enable	

Example of use)

- Digital zoom: Enable

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=OSE:70:1&res=1

[Response] AW-HE2 → PC

200 OK "OSE:70:1"

3.2.10. Camera information acquisition

These commands enable the current camera information of the camera to be acquired.

Table 3.2.10 Camera information acquisition

Command name	Category	Command	Data value	Setting	Remarks
Model number query command	Request	QID	None		
	Response	OID:[Data]	AW-HE2		Model number of camera
Camera microcontroller software version query command	Request	QSV	None		
	Response	OSV:[Data]	1.01-00-0.0 0		Camera Microcontroller software version Example: 1.01-00-0.00

Example of use)

- Model number acquisition

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=QID&res=1

[Response] AW-HE2 → PC

200 OK "OID:AW-HE2"

- Camera microcontroller software version acquisition

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=QSV&res=1

[Response] AW-HE2 → PC

200 OK "OSV:1.01-00-0.00"

3.2.11. OSD menu

These commands exercise control over the OSD menu of the camera and enable the current settings to be acquired.

Table 3.2.11 OSD menu

Command name	Category	Command	Data value	Setting	Remarks
OSD menu On/Off control command	Control	DUS:[Data]	0 1	Menu Off Menu On	The camera OSD menu is turned On or Off.
	Response	DUS:[Data]			
OSD menu On/Off query command	Request	QUS	None		
	Response	OUS:[Data]	0 1	Menu Off Menu On	
MENU switch On control command	Control	DPG DPG:[Data]	None 1		
	Response	DPG:[Data]			
ITEM switch On control command	Control	DIT DIT:[Data]	None 1		Entered.
	Response	DIT:[Data]			
YES switch On control command	Control	DUP DUP:[Data]	None 1		The cursor moves up (the value is changed).
	Response	DUP:[Data]		1Step	
NO switch On control command	Control	DDW DDW:[Data]	None 1		The cursor moves down (the value is changed).
	Response	DDW:[Data]		1Step	
OSD Off With TALLY control command	Control	OSE:75:[Data]	0 1	Off On	• The OSD menus are not displayed when "On" is selected as this setting and TALLY is On.
	Response	OSE:75:[Data]			
OSD Off With TALLY query command	Request	QSE:75	None		
	Response	OSE:75:[Data]	0 1	Off On	

Example of use)

•OSD menu: On

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=DUS:1&res=1

[Response] AW-HE2 → PC

200 OK "DUS:1"

3.2.12. Frequency setting

These commands enable the system frequency to be switched and the current setting to be acquired.

Table 3.2.12 Frequency

Command name	Category	Command	Data value	Setting	Remarks
Frequency control command	Control	OSE:77:[Data]	0 1	59.94Hz 50Hz	
	Response	OSE:77:[Data]			
Frequency query command	Request	QSE:77	None		
	Response	OSE:77:[Data]	0 1	59.94Hz 50Hz	

Example of use) Frequency: 50Hz

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=OSE:77:1&res=1

[Response] AW-HE2 → PC

200 OK "OSE:77:1"

3.2.13. Picture in Picture setting

These commands control the Picture in picture of the camera.

Table 3.2.13 Picture in Picture

Command name	Category	Command	Data value	Setting	Remarks
PinP On/Off control command	Control	OP:[Data]	0 1	Off On	
	Response	OP:[Data]			
PinP On/Off query command	Request	QP			
	Response	OP:[Data]	0 1	Off On	
PinP DisplayPos control command	Control	#PD[Data]	0 1 2 3	Upper Right Lower Right Lower Left Upper Left	
	Response	pD[Data]			
PinP DisplayPos query command	Request	#PD	NONE		
	Response	pD[Data]	0 1 2 3	Upper Right Lower Right Lower Left Upper Left	
Main/PinP Mode control command	Control	#CMP[Data]	0 1	Main PiniP	
	Response	cMP[Data]			
Main/PinP Mode query command	Request	#CMP	NONE		
	Response	cMP[Data]	0 1	Main PiniP	

Example of use)

•PinP : On

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=OP:1&res=1

[Response] AW-HE2 → PC

200 OK "OP:1"

3.2.14. Guideline settings

These commands control Guideline of HDMI outputs.

Table 3.2.14 Guideline Settings

Command name	Category	Command	Data value	Setting	Remarks
Guide Line control command	Control	#GDL[Data]	0 1	OFF ON	
	Response	gDL[Data]			
Guide Line query command	Request	#GDL	None		
	Response	gDL[Data]	0 1	OFF ON	

Example of use)

•Guideline : ON

[Control] PC → AW-HE2

http://192.168.0.10/cgi-bin/aw_cam?cmd=%23GDL1&res=1

[Response] AW-HE2 → PC

200 OK "gDL1"

4. Camera information update notification

The following restrictions apply to camera operations that are performed using HTTP communication and that have been described in the previous chapters:

- A) Even when a camera setting is changed by one terminal, the other terminals will not know that the setting has been changed unless they send the query command to the camera.
- B) In the case of a preset playback, AWB/ABB execution or other control commands that take time to be processed, it is necessary to wait until the processing is completed for the response.

By sending information autonomously from the camera to the terminals, it is possible to do the following:

- A) When a camera setting is changed by one terminal, the other terminals are notified of the setting change immediately.
- B) With a control command that takes time to be processed, the HTTP response is returned as soon as the command has been received, and separate notification of the processing result is given as soon as the processing is completed.

These functions are referred to as the camera information update notification function.

This chapter uses the term “update notification” to refer to this function.

4.1. Procedure for receiving the update notifications

An HTTP message is sent to the camera to start or stop the reception of the update notification from the camera.

At a time like this, the number of the TCP port on the terminal for receiving the update notification (having the update notification sent) is specified.

The ① update notification receive start steps and ② update notification receive end steps are each described below.

① Update notification receive start step

Example)

When reception is to be started with “192.168.0.10” used as the IP address of the camera

http://192.168.0.10/cgi-bin/event?connect=start&my_port=32000&uid=0

※ my_port ... Number of the TCP port on the terminal

Given below is the sequence which is followed when receiving the update notifications is started.

【Update notification receive start sequence】

The update notification receive start command is sent from the terminal where the update notifications are to be received.

“204 No Content” is returned from the camera which has received the command.

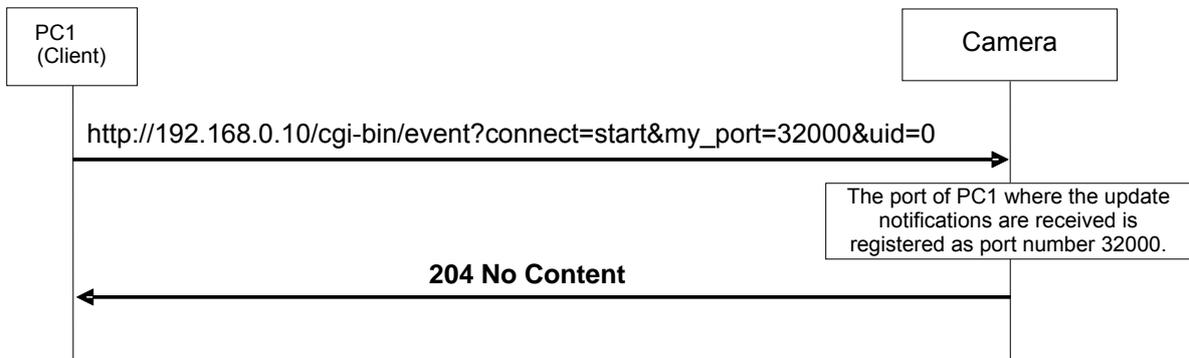


Fig.4.1-1 Update notification receive start sequence

【Caution】

Proceed with the update notification receive start step when communication has been cut off because the LAN cable has been disconnected, for example.

② Update notification receive end step

To close the application of the client, the update notification receive end step must be taken without fail.

Example)

When reception is to be ended with “192.168.0.10” used as the IP address of the camera

http://192.168.0.10/cgi-bin/event?connect=stop&my_port=32000&uid=0

※ my_port ... Number of the TCP port on the terminal

Given below is the sequence which is followed when receiving the update notifications is to be ended.

【Update notification receive end sequence】

The update notification receive end command is sent from the terminal which has received the update notifications.

“204 No Content” is returned from the camera which received the command.

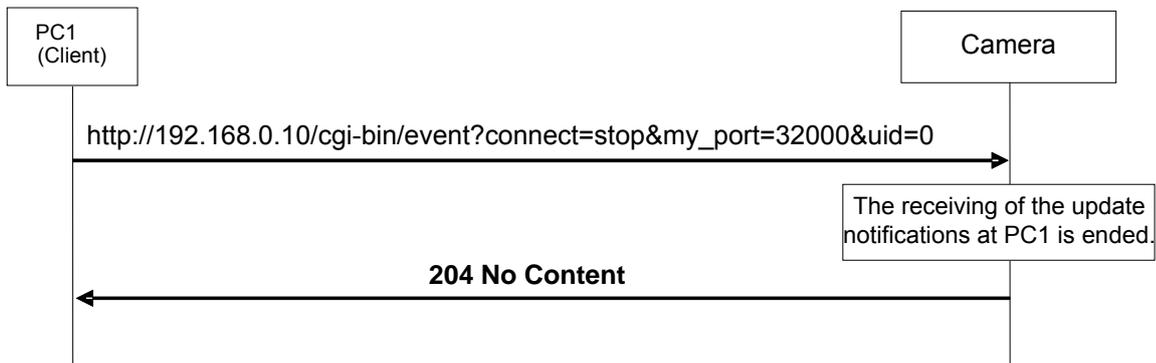


Fig.4.1-2 Update notification receive end sequence

4.2. Data format for update notifications

The data received in the update notifications will be described next.

The update notification is given to the TCP port on the terminal whose number was specified using the update notification start command by TCP protocol communication.

A breakdown of the data received is given below.

【Receive data】

Reserve (22 bytes)	Size (2 bytes)	Reserve (4 bytes)	Update notification information (Variable length: Max. 504 bytes)	Reserve (24 bytes)
-----------------------	---------------------------	----------------------	--	-----------------------

Fig.4-2 Receive data format

The updated information is set in “Update notification information” of the receive data format.

The data received from the camera has a variable length.

The size of the update notification information is the value obtained by subtracting 8 bytes from the “Size” area setting.

• “Update notification information” data length = “Size” – 8 bytes

The updates of the camera are described in the update notification information.

The format used for the update notification information received from the camera is given below.

【Update notification information format】

[CR][LF][Command response format][CR][LF]

※ [CR]:0x0d, [LF]:0x0a

Example 1) Power: On

[CR][LF]**p1**[CR][LF]

Example 2) Color bar: On

[CR][LF]**DCB:1**[CR][LF]

4.3. Setting change sequence

Update notifications are sent when the settings or statuses of the camera have been changed.

Given below is an example of the update notification sequence.

It is assumed that the update notification start command has been sent to all the terminals in the sequence and that the terminals can receive the update notifications from the camera.

4.3.1. Changing the settings from a terminal

【Changing the settings from the local terminal】

When the settings of the camera have been changed from the local terminal (PC1), the changes are also posted by an update notification separately from the HTTP response to the command.

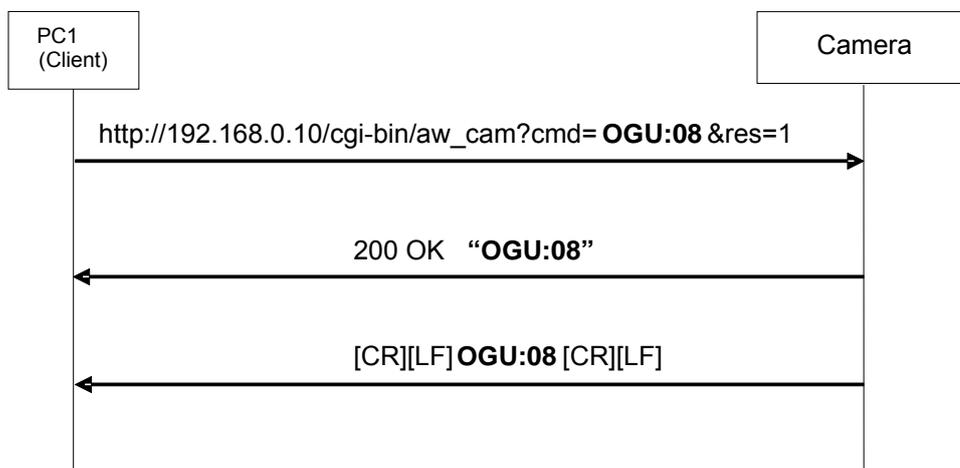


Fig.4.3.1-1 Changing the settings from the local terminal

【Changing the settings from another terminal】

When a camera setting has been changed from another terminal (PC2), the local terminal (PC1) is also notified of the change.

In addition to the HTTP response to the command, the other terminal (PC2) is notified of the change by an update notification as well.

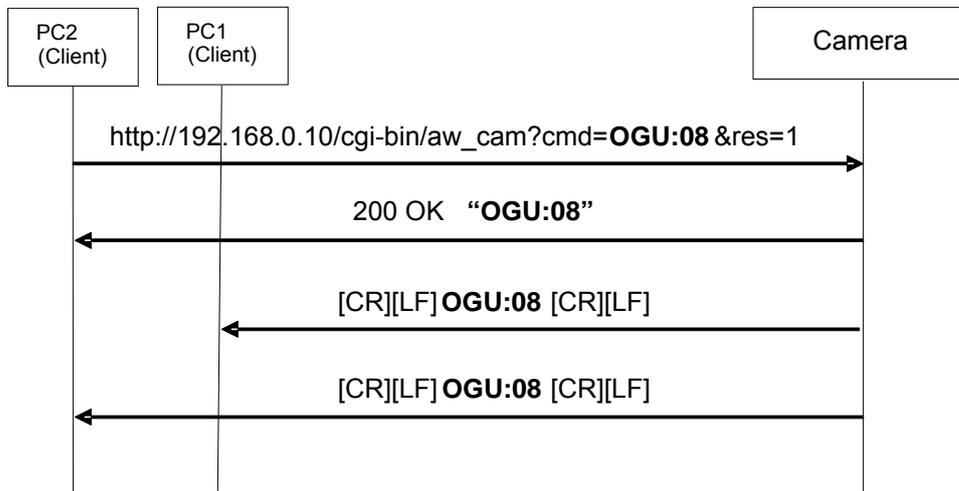


Fig.4.3.1-2 Changing the settings from another terminal

(Remarks)

When the camera receives the control command and its setting is changed, it gives an update notification.

(It does not give an update notification if a query command has been received.)

However, when any of the following commands have been received, the update notification is not given.

① OSD menu

Table 4.3.1-1

Command name		Command
OSD menu Off/On	control command	DUS:[Data]
MENU switch On	control command	DPG
ITEM switch On	control command	DIT
YES switch On	control command	DUP
NO switch On	control command	DDW

② Pan, tilt, zoom, focus and iris operation commands

<System control commands>

Table 4.3.1-2

Command name		Command
Pan/tilt	control command	#APC[Data1][Data2]
		#P[Data]
		#T[Data]
		#PTS[Data1][Data2]
Zoom	control command	#AXZ[Data]
		#Z[Data]
Iris position	control command	#I [Data]
		#AXI [Data]

<Camera control commands>

Table 4.3.1-3

Command name		Command
Contrast level (Picture level)	control command	OSD:48:[Data]

4.3.2. Setting value initialization

The contents of the table below are posted in succession by the update notifications when the settings have been initialized using the OSD menu of the camera or from the web screen.

Table 4.3.2

Notification	Remarks
OSD:48	Contrast level
wLC	Wireless Control
OCG	Chroma level
OAW	AWB (AWC) mode
OSE:33	DRS
OSA:87	Format
OUS	OSD menu On/Off
OSE:20	Down-conversion mode
OSE:70	Digital zoom On/Off
OSE:75	OSD Off With TALLY
OSE:77	Frequency
OBR	Color Bars setting
ORS	Iris Auto/Manual
pE00000000	Preset ALL clear

The sequence during setting value initialization is as follows.

【Setting value initialization sequence】

The items whose settings have been changed by initialization are notified in succession when the settings are initialized using the OSD menu of the camera or from the web screen.

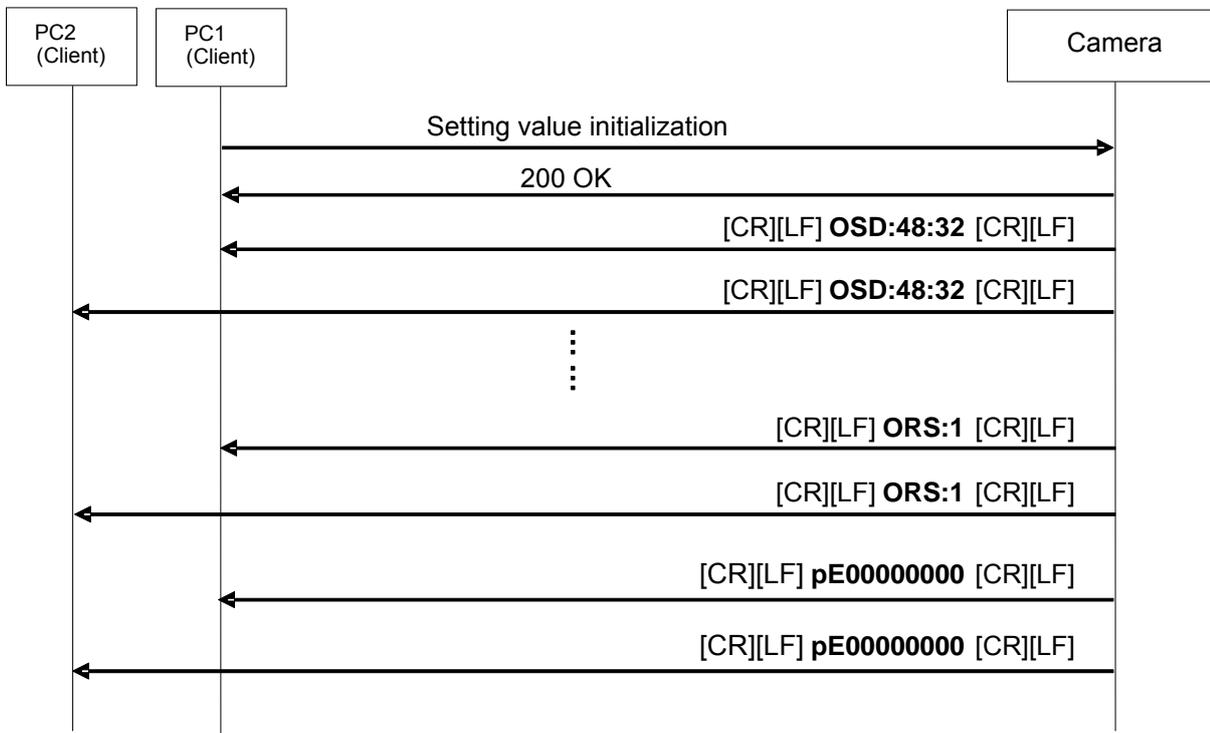


Fig.4.3.2 Setting value initialization

Described below are sequences which differ from the ones described in the previous pages.

4.4. Special sequences

Update notifications are sometimes sent at times other than when the settings or statuses of the camera have been changed.

Some cases are presented below.

It is assumed that the update notification start command has been sent to all the terminals in the sequence and that the terminals can receive the update notifications from the camera.

4.4.1. Version information notification

The version information is posted in 60-second cycles.

The information posted is given below.

Table 4.4.1

Notification	Version information
qSV3V**.* ** ** ** **	qSV3V1.01-00-0.00

Given below is the sequence which is followed when the version information is received.

【Sequence when the version information is received】

The camera sends the version information in 60-second cycles, and this information is received by terminals PC1 and PC2.

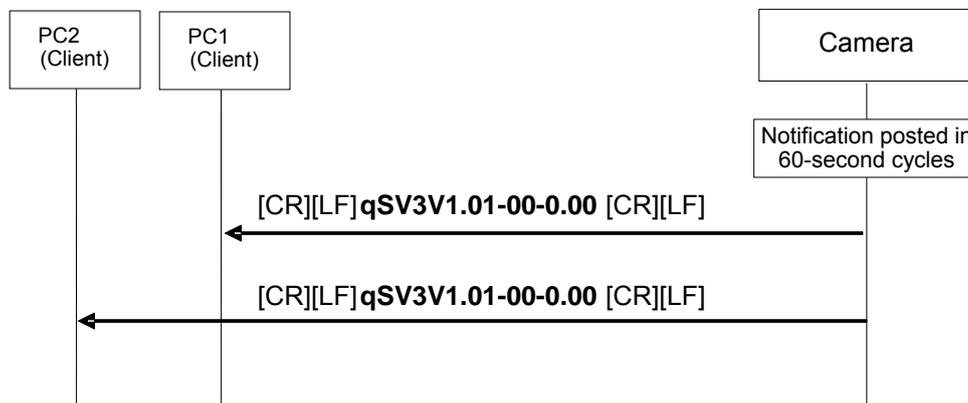


Fig.4.4.1 Sequence when the version information is received

4.4.2. LPI information (lens information)

Notification is sent in a 300ms cycle when “On: Information is posted” has been set for the lens information notification On/Off control command in “3.1.5. Lens information notification” and a change has been made in the LPI information (lens information). The table below lists what is notified.

Table 4.4.2

Notification	Lens information	Remarks
IPI [ZZZ] [FFF] [III]	ZZZ…… Zoom position FFF…… Focus position III …… Iris position	AW-HE2 only supports Fix response. IPI555555FFF

Given below is the sequence which is followed when changes in the LPI (lens) information are received.

【Sequence when LPI information (lens information) is changed】

When the camera detects changes in the LPI (lens) information, the changed LPI (lens) information is sent to the terminals, and terminals PC1 and PC2 receive this information.

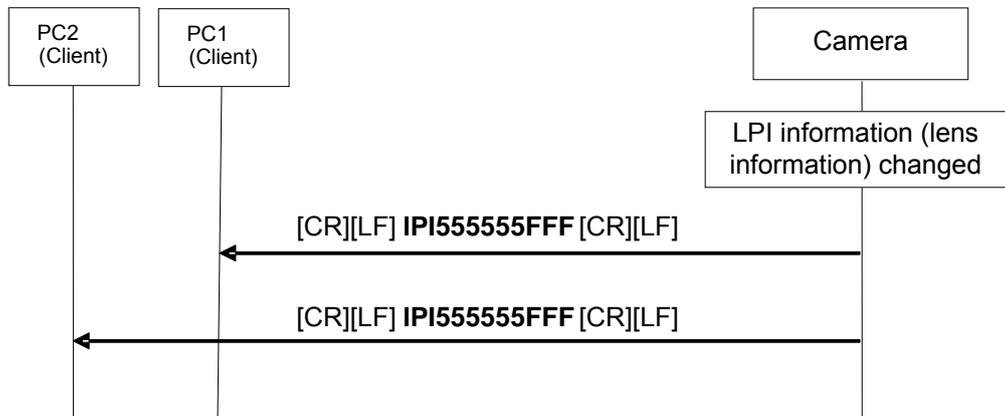


Fig.4.4.2 Sequence when LPI information is changed

4.4.3. Preset playback

This command sends the preset playback completion notification as an update notification when preset playback in the camera has been completed. The table below gives the notification details.

Table 4.4.3

Notification	Remarks
q[numeral]	Number of the preset which was played back

Given below is the sequence which is followed when presets are played back.

【Preset playback sequence】

This is the sequence in which preset number 08 is played back.

As soon as the preset playback command is received, “s07” is returned as the HTTP response, and as soon as the playback is completed after this, “q07” is posted separately as the update notification.

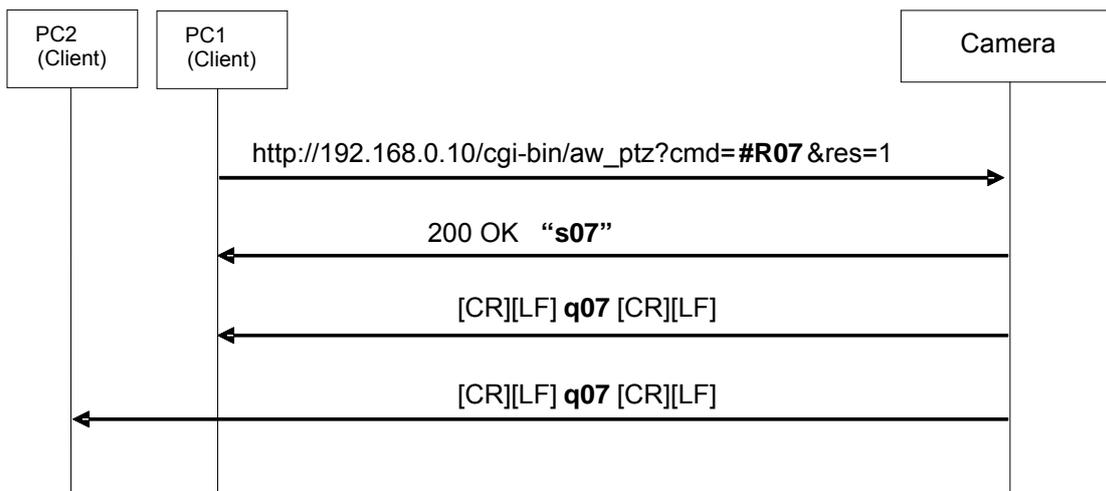


Fig.4.4.3 Preset playback

4.4.4. AWB/ABB execution

This command sends the execution results as an update notification when execution of AWB/ABB has been completed by the camera.

The table below lists what is notified.

Table 4.4.4-1 AWB result

Notification	Remarks
OWS	AWB execution successful
ER3:OWS	AWB execution failed

Table 4.4.4-2 ABB result

Notification	Remarks
OAS	ABB execution successful

Given below is an example of the sequence which is followed when AWB is executed.

【AWB execution sequence】

As soon as the AWB execution command is received, “204 No Content” is returned as the HTTP response, and as soon as the AWB execution is completed, “OWS” is posted separately as the update notification.

For details on what happens if AWB execution has failed, refer to “6. Error return”.

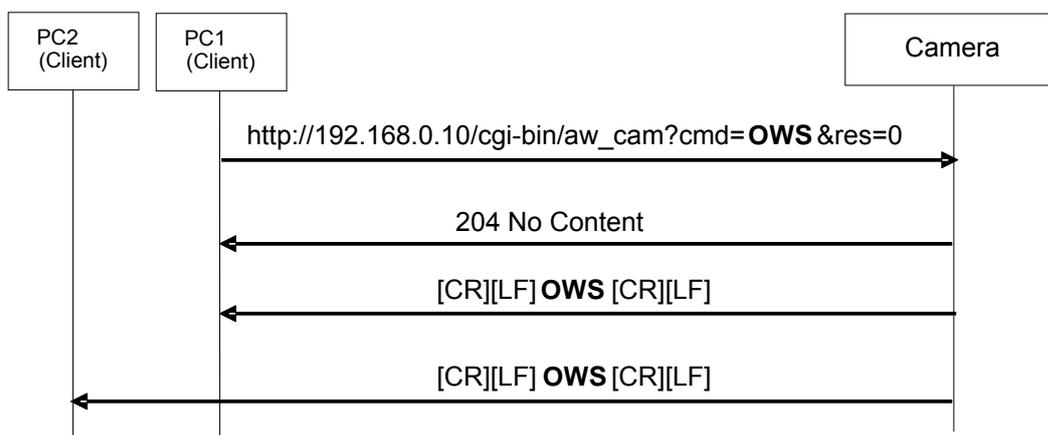


Fig.4.4.4 AWB execution

4.4.5. AWB Mode switching

The contents of the table below are posted in succession by update notifications when the AWB Mode setting has been switched.

Table 4.4.5

Notification	Remarks
OAW	AWB Mode

The sequence below is followed when the AWB Mode is switched.

【AWB Mode switching sequence】

This sequence is followed if AWB Mode is switched to “AWB A”.

As the response to the AWB Mode switching command, “OAW:1” is returned.

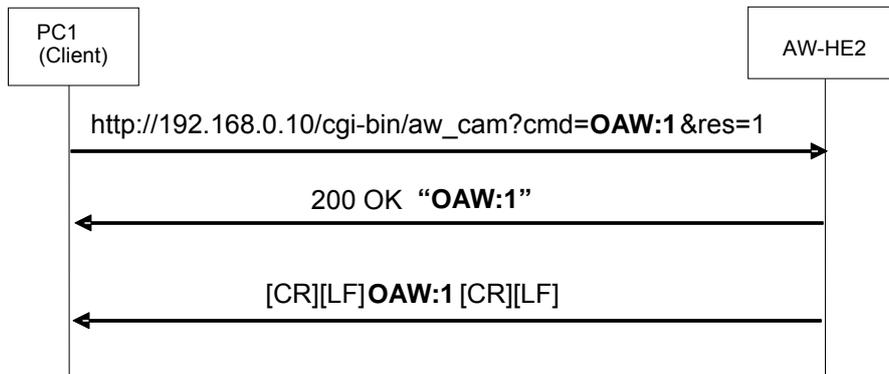


Fig.4.4.5 AWB Mode switching

5. Camera information batch acquisition

All the information of the camera can be acquired together as a batch.

[Command format]

[Send]

http://[IP Address]/live/camdata.html

※IP Address IP address of camera at connection destination

[Receive]

200 OK "Camera information"

Where:

※Camera information .. Camera information listed in Table 5.1;
[CR] and [LF] are used as the delimiters of the information.

[Sequence]

The camera information is acquired from PC1. "200 OK [Camera information]" is returned as the response from the camera.

Given below is the command sequence.

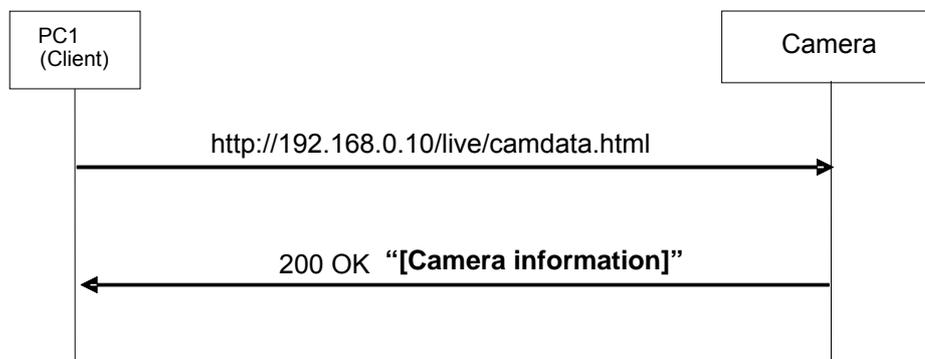


Fig.5-1 Camera information batch acquisition sequence

Table 5-1

Camera information	Command	[data] section
PowerOn/Off status	p[data]	0 : PowerOff 1 : PowerOn
Model Name	OID:[data]	AW-HE2 (fixed)
CGI send interval	---	CGI_TIME:0 (fixed)
Format	OSA:87:[data]	01: 720/59.94p 02: 720/50p 04: 1080/59.94i 05: 1080/50i 10: 1080/59.94p 11: 1080/50p 12: 480/59.94p 13: 576/50p
Camera Title	---	TITLE:[data (Max. 20 half-size characters)]
AWB Mode	OAW:[data]	0:ATW 1:AWB A 2:AWB B 3:ATW 4:3200K 5:5600K 6:4500K 7:6000K 8:2800K
Camera/ColorBar	OBR:[data]	0: Camera 1: ColorBar
OSD On/Off	OUS:[data]	0: Off 1: On
Iris Mode	d3[data]	0: Manual 1: Auto
Latest Call Preset No.	s[data]	1~9
Iris Follow	OSD:4F:[data]	00: Close : FF: Open
P/T Mode of Preset	rt[data]	1 (fixed)
Zoom Position	axz[data]	555: Wide
Focus Position	axf[data]	555: Near
Preset Entry No.001~040	pE00[data]	000000000~FFFFFFFFF (40bit) bit01: Preset-No.001 : bit09: Preset-No.009 0: No Entry 1: Entry
Preset Entry No.041~080	pE01[data]	000000000(fixed)
Preset Entry No.081~100	pE02[data]	000000000(fixed)

6. Error return

The three errors ER1, ER2 and ER3 below are returned in response to control or query commands by the camera.

① ER1 (unsupported command)

This error is generated when a command which is not supported by the camera has been received by the camera.

Example) When the non-existent “XF” command is executed for the camera

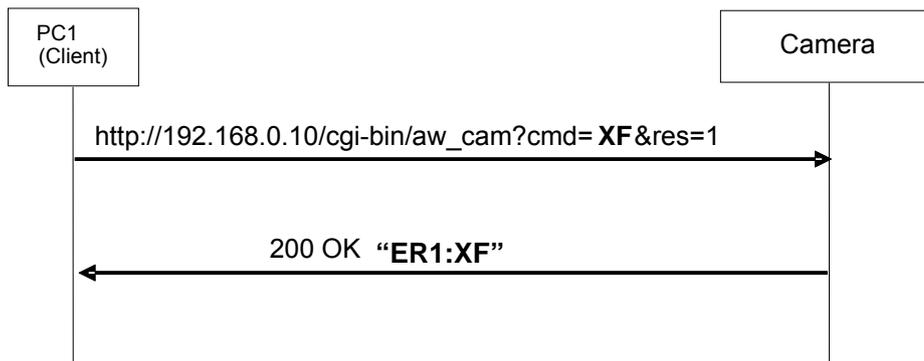


Fig.6-1 Error (ER1)

② ER2 (busy status)

This error is generated during the camera is cannot be operated now.

Example) ZOOM position is “Wide state”, when “Pan Control” is performed.

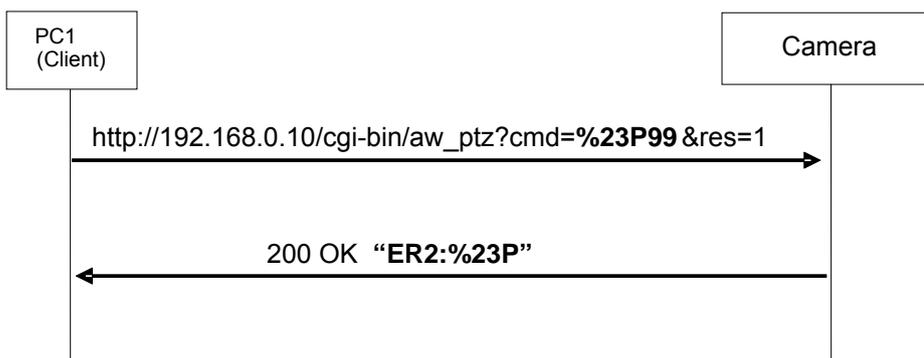


Fig.6-2 Error (ER2)

③ ER3 (outside acceptable range)

This error is generated when the data value of a command is outside the acceptable range.

Example)

The Preset Playback command was executed with a data value of “100” which is outside the acceptable range.

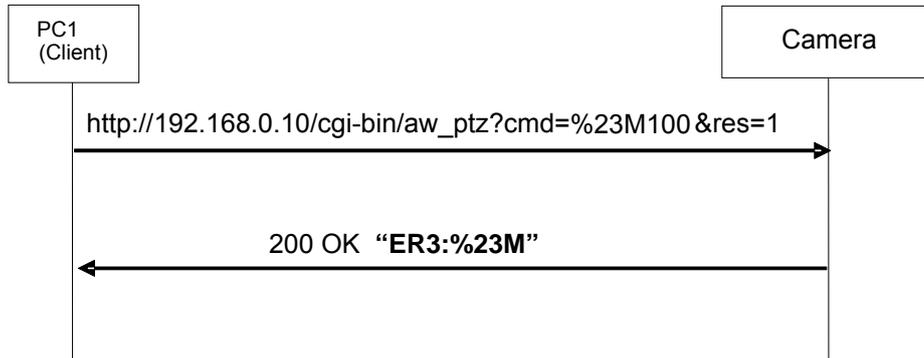


Fig.6-3 Error (ER3)

<Appendix>

This manual describes the HTTP messages using the format for input to the address bar of the web browser as in the example given below.

(Example: http://192.168.0.10/cgi-bin/aw_ptz?cmd=%23PTS5050&res=1)

The actual HTTP messages are in compliance with the HTTP1.1 communication specifications, and have the [Send] and [Receive] formats as given below.

[Send]

A command such as the ones listed below is sent after connection has been made to the specified port (default: 80) which has been set for the camera.

Method: GET

GET /cgi-bin/aw_ptz?cmd=#PTS5050&res=1 HTTP/1.1[CR][LF]	Request
Accept: image/gif, ... (omitted) ... , */*[CR][LF] Referer: http://192.168.0.10/[CR][LF] Accept-Language: en[CR][LF] Accept-Encoding: gzip, deflate[CR][LF] User-Agent: AW-Cam Controller[CR][LF] Host: 192.168.0.10[CR][LF] Connection: Keep-Alive[CR][LF]	Header
[CR][LF]	Blank line

[Receive]

A message with the command name and result value contained in the message body of the HTTP response message is received.

In this manual, this message is given as 200 OK “pTS5050”, but in actual fact commands such as the following ones are received.

HTTP/1.1 200 OK[CR][LF]	Response
Connection: Close[CR][LF] Content-Type: Text/plain[CR][LF] Set-Cookie: Session=0[CR][LF] Accept-Ranges: bytes[CR][LF] Cache-control: no-cache[CR][LF] Content-length: 7[CR][LF] Date: Mon, 05 Dec 2012 00:00:00 GMT[CR][LF]	Header
[CR][LF]	Blank line
pTS5050	Message body