

AVer-PAV-Camera-USB-API

Version 1.0

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Revision History

Version Number	Date	Author(s)	Remark
1.0	Oct 21, 2026	Marco Hsu	Preliminary version for PTZV2, TRV3, TR322 and TR535

Table of Content

1. Introduction.....	4
2. Vendor Id & Product Id.....	4
3. Video.....	5
(1) USB Video Class.....	5
(a) Video Formats.....	5
(b) Camera Terminal.....	6
(c) Processing Unit.....	8
(d) Extension Unit – AVer XU1.....	10
(e) Extension Unit – AVer XU2.....	16
(f) Extension Unit – AVer XU3.....	20
(g) Extension Unit – AVer XU4.....	22
(h) Extension Unit – AVer XU5.....	25
(i) Extension Unit – AVer XU6 (TR535 only).....	30
(j) Extension Unit – Zoom Camera Control.....	31
4. Audio.....	33
(1) USB Audio Class.....	33
(a) Feature Unit.....	33
5. Reference.....	34

1. Introduction

This document contains information about the AVer USB API of the PTZV2 series (PTZ310UV2, PTZ310UNV2, PTZ330UV2, PTZ330UNV2), the TRV3 series (TR315, TR315N, TR335, TR335N), the TR322 and the TR535 series (TR535, TR535N). It describes the USB Video Class (UVC) and USB Audio Class (UAC) controls a host can use to operate the camera, including the AVer UVC Extension Units.

Requests are sent as UVC class-specific requests (bmRequestType 0x21 for SET_CUR, 0xA1 for GET_*). wValue carries the control selector in the high byte; wIndex carries the unit Id in the high byte and the VideoControl interface number in the low byte. A request to an unsupported control selector is stalled.

2. Vendor Id & Product Id

The PTZV2, TRV3 and TR322 cameras enumerate as a composite device with one UVC function and one UAC function under the same Vendor Id and Product Id. The TR535 enumerates as a composite device with two UVC functions (PTZ camera and wide camera) and one UAC function under the same Vendor Id and Product Id. All models support USB 3.x and USB 2.0.

Model	Function	Vendor Id	Product Id
PTZ310UV2 / PTZ310UNV2	UVC, UAC	0x2574	0x0563
PTZ330UV2 / PTZ330UNV2	UVC, UAC	0x2574	0x0564
TR315 / TR315N	UVC, UAC	0x2574	0x0566
TR335 / TR335N	UVC, UAC	0x2574	0x0567
TR322	UVC, UAC	0x2574	0x0570
TR535 / TR535N	UVC (PTZ), UVC (Wide), UAC	0x2574	0x056B

- PTZV2 / TRV3 / TR322: Manufacturer string: "AVer Inc."; Product string: "AVer <model>", e.g. "AVer TR315". The UAC function is not present when USB audio is disabled in the camera settings, or when the camera runs in Zoom or Teams mode. In that case a CDC (ACM) interface is present instead; it is not part of this API.
- TR535 / TR535N: Manufacturer string: "AVer Information Inc."; Product string: "AVer TR535" / "AVer TR535N". Interface strings: "AVer TR535 PTZ", "AVer TR535 Wide" and "AVer Audio TR535". The wide camera UVC function is not present when the camera runs in Zoom or Teams mode, when the host is macOS, or when the dual USB camera setting is disabled. The UAC function is not present when USB audio is disabled in the camera settings, or when the camera runs in Zoom or Teams mode.
- TR535: the camera controls (Camera Terminal, Processing Unit and Extension Units) are offered on the PTZ camera function. The wide camera function reports no controls.
- Changing the power line frequency, the camera mode or the USB audio setting makes the camera re-enumerate.

3. Video

(1) USB Video Class

(a) Video Formats

Model	Format	Resolution	Frame Rate (fps)
PTZV2 / TRV3 (USB 3.x)	MJPEG	3840x2160	60, 30, 15
		1920x1080	60, 30, 15
		1280x960	60, 30, 15
		1280x720	60, 30, 15
	YUY2	1920x1080	30, 15
PTZV2 / TRV3 (USB 2.0)	MJPEG	3840x2160	60, 30, 15
		1920x1080	60, 30, 15
		1280x960	60, 30, 15
		1280x720	60, 30, 15
	YUY2	1280x720	15
TR322 (USB 3.x)	MJPEG	1920x1080	60, 30, 15
		1280x960	60, 30, 15
		1280x720	60, 30, 15
	YUY2	1920x1080	30, 15
TR322 (USB 2.0)	MJPEG	1920x1080	60, 30, 15
		1280x960	60, 30, 15
		1280x720	60, 30, 15
	YUY2	1280x720	15
TR535 PTZ (USB 3.x)	YUY2	1920x1080	30, 15
		1280x720	30, 15
		640x360	30, 15
	MJPEG	1920x1080	60, 30, 15
		1280x720	60, 30, 15
TR535 Wide (USB 3.x)	YUY2	1920x1080	30, 15
		1280x720	30, 15
		640x360	30, 15
	MJPEG	1920x1080	30, 15
		1280x720	30, 15
TR535 PTZ / Wide (USB 2.0)	YUY2	640x360	30, 15
	MJPEG	1920x1080	30, 15
		1280x720	30, 15

- YUY2: uncompressed YUV 4:2:2, 16 bits per pixel. MJPEG: Motion JPEG. Video is transferred on a bulk endpoint.
- The list above is the default (Standard mode, 60 Hz power line frequency). With 50 Hz power line frequency, 60 / 30 fps become 50 / 25 fps (PTZV2 / TRV3 USB 2.0 YUY2 and TR322 are unchanged).
- PTZV2 / TRV3: in Portrait mode the resolutions are rotated (MJPEG 1080x1920, 960x1280, 720x1280; YUY2 1080x1920 on USB 3.x, 720x1280 on USB 2.0). In Teams mode: MJPEG 1920x1080 and 1280x720; YUY2 1920x1080, 1280x720 and 640x360 on USB 3.x, 640x360 on USB 2.0; all at 30 fps (25 fps at 50 Hz).
- TR322: with the 4K30 priority mode the MJPEG list becomes 1920x1080, 1280x960 and 1280x720 at 30, 15 fps, plus 3840x2160 at 30, 15 fps in USB or Zoom mode. Teams mode on USB 3.x: MJPEG 1920x1080 and 1280x720 (4K30 priority mode: 3840x2160 and 2560x1440), YUY2 1920x1080, 1280x720 and 640x360; on USB 2.0: MJPEG 1920x1080 and 1280x720, YUY2 640x360; all at 30 fps (25 fps at 50 Hz).
- TR535: the USB 3.x MJPEG list depends on the camera mode. USB mode: PTZ adds 3840x2160 at 60, 30, 15

fps, and the wide camera offers YUY2 only. Zoom mode: 3840x2160, 1920x1080 and 1280x720 at 30, 15 fps. Teams mode: MJPEG 3840x2160 and 2560x1440 at 30, 15 fps. NDI mode: YUY2 only. With lens distortion correction on, the frame rates are limited to 30 fps (UHD) or the resolutions to 1920x1080 (FHD).

(b) Camera Terminal

(i) Camera Terminal Control Selectors

Control Selector	Value	Supported
CT_SCANNING_MODE_CONTROL	0x01	No
CT_AE_MODE_CONTROL	0x02	Yes, not in bmControls (same as XU2 0x02)
CT_AE_PRIORITY_CONTROL	0x03	No
CT_EXPOSURE_TIME_ABSOLUTE_CONTROL	0x04	Yes, not in bmControls (same as XU2 0x03)
CT_EXPOSURE_TIME_RELATIVE_CONTROL	0x05	No
CT_FOCUS_ABSOLUTE_CONTROL	0x06	Yes
CT_FOCUS_RELATIVE_CONTROL	0x07	No
CT_FOCUS_AUTO_CONTROL	0x08	Yes
CT_IRIS_ABSOLUTE_CONTROL	0x09	Yes, not in bmControls (same as XU2 0x05)
CT_IRIS_RELATIVE_CONTROL	0x0A	No
CT_ZOOM_ABSOLUTE_CONTROL	0x0B	Yes
CT_ZOOM_RELATIVE_CONTROL	0x0C	Yes
CT_PANTILT_ABSOLUTE_CONTROL	0x0D	Yes
CT_PANTILT_RELATIVE_CONTROL	0x0E	Yes
CT_ROLL_ABSOLUTE_CONTROL	0x0F	No
CT_ROLL_RELATIVE_CONTROL	0x10	No
CT_PRIVACY_CONTROL	0x11	No

- Unit Id 0x01. GET_LEN is not supported.
- "Not in bmControls": supported, but not listed in the Camera Terminal descriptor; reachable with raw control requests only.
- For 3 seconds after the host connects, SET_CUR on zoom, pan/tilt and focus (absolute) is accepted but ignored.

(ii) Focus (Absolute) Control

Control Selector	CT_FOCUS_ABSOLUTE_CONTROL			
Mandatory Requests	SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO			
wLength	2			
Offset	Field	Size	Value	Description
0	wFocusAbsolute	2	Number	Focus position MIN 0, MAX 255, DEF 128, RES 1

- TR535 rejects SET_CUR while Focus, Auto is on.

(iii) Focus, Auto Control

Control Selector	CT_FOCUS_AUTO_CONTROL			
Mandatory Requests	SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO			
wLength	1			

Offset	Field	Size	Value	Description
0	bFocusAuto	1	Boolean	0: Manual focus 1: Auto focus (default)

(iv) Zoom (Absolute) Control

Control Selector		CT_ZOOM_ABSOLUTE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		2		
Offset	Field	Size	Value	Description
0	wObjectiveFocalLength	2	Number	Zoom ratio x 100, e.g. 100 = 1x, 1200 = 12x MIN 100, DEF 100, RES 1 MAX: 1200: PTZ310UV2 / PTZ310UNV2 / TR315 / TR315N 3000: PTZ330UV2 / PTZ330UNV2 / TR335 / TR335N / TR322 / TR535 / TR535N With digital zoom enabled, MAX is 1200 higher.
Zooming turns auto tracking off.				

(v) Zoom (Relative) Control

Control Selector		CT_ZOOM_RELATIVE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		3		
Offset	Field	Size	Value	Description
0	bZoom	1	Signed number	0: Stop 1: Moving to telephoto direction 0xFF: Moving to wide-angle direction
1	bDigitalZoom	1	Boolean	0 or 1
2	bSpeed	1	Number	Ignored, the camera zooms at maximum speed

(vi) PanTilt (Absolute) Control

Control Selector		CT_PANTILT_ABSOLUTE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		8		
Offset	Field	Size	Value	Description
0	dwPanAbsolute	4	Signed number	Pan position in arc seconds. MIN / MAX: pan limits of the model; DEF 0
4	dwTiltAbsolute	4	Signed number	Tilt position in arc seconds. MIN / MAX: tilt limits of the model; DEF 0
GET_RES returns the motor step in arc seconds. The position is rounded to the step.				

(vii) PanTilt (Relative) Control

Control Selector		CT_PANTILT_RELATIVE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		4		

Offset	Field	Size	Value	Description
0	bPanRelative	1	Signed number	0: Stop 1: Moving to clockwise direction 0xFF: Moving to counter clockwise direction
1	bPanSpeed	1	Number	Ignored, the camera moves at maximum speed
2	bTiltRelative	1	Signed number	0: Stop 1: Point the imaging plane up 0xFF: Point the imaging plane down
3	bTiltSpeed	1	Number	Ignored, the camera moves at maximum speed

(c) Processing Unit

(i) Processing Unit Control Selectors

Control Selector	Value	Supported
PU_BACKLIGHT_COMPENSATION_CONTROL	0x01	Yes
PU_BRIGHTNESS_CONTROL	0x02	Yes
PU_CONTRAST_CONTROL	0x03	Yes
PU_GAIN_CONTROL	0x04	PTZV2 / TRV3 / TR322: Yes TR535: Yes, not in bmControls
PU_POWER_LINE_FREQUENCY_CONTROL	0x05	Yes
PU_HUE_CONTROL	0x06	Yes
PU_SATURATION_CONTROL	0x07	Yes
PU_SHARPNESS_CONTROL	0x08	Yes
PU_GAMMA_CONTROL	0x09	No
PU_WHITE_BALANCE_TEMPERATURE_CONTROL	0x0A	Yes
PU_WHITE_BALANCE_TEMPERATURE_AUTO_CONTROL	0x0B	Yes
PU_WHITE_BALANCE_COMPONENT_CONTROL	0x0C	TR535: Yes PTZV2 / TRV3 / TR322: Yes, not in bmControls
PU_WHITE_BALANCE_COMPONENT_AUTO_CONTROL	0x0D	Yes, not in bmControls (same as XU2 0x08)
PU_DIGITAL_MULTIPLIER_CONTROL	0x0E	No
- Unit Id 0x02. GET_LEN is not supported. - For 3 seconds after the host connects, SET_CUR on Backlight Compensation and Power Line Frequency is accepted but ignored.		

(ii) Backlight Compensation Control

Control Selector	PU_BACKLIGHT_COMPENSATION_CONTROL			
Mandatory Requests	SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO			
wLength	2			
Offset	Field	Size	Value	Description
0	wBacklightCompensation	2	Number	Wide dynamic range (WDR) level MIN 0, MAX 2, DEF 2, RES 1

(iii) Brightness Control

Control Selector	PU_BRIGHTNESS_CONTROL
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Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		2		
Offset	Field	Size	Value	Description
0	wBrightness	2	Signed number	PTZV2 / TRV3 / TR322: MIN -10, MAX 10, DEF 0, RES 1 TR535: exposure level, same as XU1 Exposure Level, MIN 1, MAX 9, DEF 5, RES 1

(iv) Contrast Control

Control Selector		PU_CONTRAST_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		2		
Offset	Field	Size	Value	Description
0	wContrast	2	Number	MIN 0, MAX 4, DEF 2, RES 1

(v) Gain Control

Control Selector		PU_GAIN_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		2		
Offset	Field	Size	Value	Description
0	wGain	2	Number	MIN 0, MAX 14, DEF 0, RES 1

(vi) Power Line Frequency Control

Control Selector		PU_POWER_LINE_FREQUENCY_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		1		
Offset	Field	Size	Value	Description
0	bPowerLineFrequency	1	Number	0: 59.94 Hz 1: 50 Hz 2: 60 Hz (default)
The values differ from the UVC definition (0: Disabled). Changing the value makes the camera re-enumerate with the matching frame rates.				

(vii) Hue Control

Control Selector		PU_HUE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		2		
Offset	Field	Size	Value	Description
0	wHue	2	Signed number	MIN -1000, MAX 1000, DEF 0, RES 100

(viii) Saturation Control

Control Selector		PU_SATURATION_CONTROL		
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Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		2		
Offset	Field	Size	Value	Description
0	wSaturation	2	Number	MIN 0, MAX 10, DEF 5, RES 1

(ix) Sharpness Control

Control Selector		PU_SHARPNESS_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		2		
Offset	Field	Size	Value	Description
0	wSharpness	2	Number	MIN 0, MAX 3, DEF 2, RES 1

(x) White Balance Temperature Control

Control Selector		PU_WHITE_BALANCE_TEMPERATURE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		2		
Offset	Field	Size	Value	Description
0	wWhiteBalanceTemperature	2	Number	Kelvin MIN 2800, MAX 10000, DEF 2800, RES 1

(xi) White Balance Temperature, Auto Control

Control Selector		PU_WHITE_BALANCE_TEMPERATURE_AUTO_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		1		
Offset	Field	Size	Value	Description
0	bWhiteBalanceTemperatureAuto	1	Boolean	0: Manual 1: Auto (default)

(xii) White Balance Component Control

Control Selector		PU_WHITE_BALANCE_COMPONENT_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO		
wLength		4		
Offset	Field	Size	Value	Description
0	wWhiteBalanceBlue	2	Number	MIN 0, MAX 255, DEF 128, RES 1
2	wWhiteBalanceRed	2	Number	MIN 0, MAX 255, DEF 128, RES 1

(d) Extension Unit – AVer XU1

(i) GUID

{366966CB-266E-47A0-8451-96ECF60330D6}

(ii) AVer XU1 Selectors

Control Selector	Value	Model	In bmControls
UVCX_UCAM_ISP_START	0x05	All	Yes
UVCX_UCAM_STATUS	0x0B	All	Yes
UVCX_UCAM_EXPOSURE	0x0C	All	Yes
UVCX_UCAM_WHITE_BALANCE	0x0D	All	Yes
UVCX_UCAM_NOISE_REDUCTION	0x0E	All	Yes
UVCX_UCAM_FLIP	0x0F	All	Yes
UVCX_UCAM_MIRROR	0x10	All	Yes
UVCX_UCAM_PRESET	0x12	All	Yes
UVCX_UCAM_NAME	0x13	All	Yes
UVCX_UCAM_FW_VERSION	0x14	All	Yes
UVCX_UCAM_XU_API_PARAM	0x15	PTZV2 / TRV3 / TR322	Yes
UVCX_UCAM_XU_API_EXEC	0x16	PTZV2 / TRV3 / TR322	Yes
UVCX_UCAM_VISCA_PROTOCOL	0x15	TR535	Yes
UVCX_UCAM_VISCA_ADDR	0x16	TR535	Yes
UVCX_UCAM_VISCA_BAUD	0x17	TR535	Yes
UVCX_UCAM_IR_ID	0x19	All	Yes
UVCX_UCAM_RESET	0x1A	All	Yes
UVCX_UCAM_PANTILT_RELATIVE_CONTR OL	0x1B	All	Yes
UVCX_UCAM_ZOOM_RELATIVE_CONTRO L	0x1C	All	Yes
UVCX_UCAM_VISCA_OVER_IP	0x1E	All	Yes

(iii) ISP Start (USB Firmware Update Mode)

Control Selector	UVCX_UCAM_ISP_START			
Mandatory Requests	GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN			
wLength	2			
Offset	Field	Size	Value	Description
0	wStatus	2	Number	GET_CUR: Switches the camera to USB firmware update mode and returns 0x0000.
After GET_CUR, the camera re-enumerates as a USB CDC (ACM) device for the firmware update. The UVC and UAC functions are not present until the camera restarts.				

(iv) Camera Status

Control Selector	UVCX_UCAM_STATUS			
Mandatory Requests	GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN			
wLength	2			
Offset	Field	Size	Value	Description
0	wStatus	2	Bitmap	D0: 1 = UVC video is streaming D1 – D15: Reserved, 0

(v) Exposure Level

Control Selector	UVCX_UCAM_EXPOSURE
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(vi) White Balance Temperature

Control Selector		UVCX_UCAM_WHITE_BALANCE		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	wWbt	2	Number	White balance temperature in Kelvin MIN 2800, MAX 10000, DEF 2800, RES 1

(vii) Noise Reduction

Control Selector		UVCX_UCAM_NOISE_REDUCTION		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bNoiseReduction	1	Number	Noise reduction level MIN 0, MAX 3, DEF 1, RES 1

(viii) Flip

Control Selector		UVCX_UCAM_FLIP		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bFlip	1	Boolean	0: Off (default) 1: On

(ix) Mirror

Control Selector		UVCX_UCAM_MIRROR		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bMirror	1	Boolean	0: Off (default) 1: On

(x) Preset

Control Selector		UVCX_UCAM_PRESET		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		3		
Offset	Field	Size	Value	Description
0	bSaveRestore	1	Number	SET_CUR: 0: Save the current position to the preset 1: Recall the preset 2: Clear the preset GET_CUR: always 0

1	wPresetId	2	Number	Preset number, 0 – 255 GET_CUR: the last preset number used
- Recalling a preset that has not been saved fails. - GET_MAX returns {1, 256}.				

(xi) Camera Name

Control Selector		UVCX_UCAM_NAME		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		32		
Offset	Field	Size	Value	Description
0	Name	32	String	Camera name, null-terminated

(xii) Firmware Version

Control Selector		UVCX_UCAM_FW_VERSION		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		32		
Offset	Field	Size	Value	Description
0	Ver	32	String	Firmware version, null-terminated

(xiii) XU API Parameter

Control Selector		UVCX_UCAM_XU_API_PARAM		
Mandatory Requests		SET_CUR, GET_CUR, GET_INFO, GET_LEN		
wLength		60		
Offset	Field	Size	Value	Description
0	bApiVersion	1	Bitmap	Read only. 0x80: Camera option access supported
1	bParameterType	1	Number	Read only. Type of the selected option: 0: None 1: Integer 2: String
2	bParameterLength	1	Number	Length of the option key in bBuffer, without the terminating null
3	bBuffer	57	String	Option key, e.g. "img_flip"
- SET_CUR selects a camera option by its key. The request fails if the key is unknown, or if bParameterLength does not equal the string length of bBuffer. - See (x) XU API Sequence.				

(xiv) XU API Execution

Control Selector		UVCX_UCAM_XU_API_EXEC		
Mandatory Requests		SET_CUR, GET_CUR, GET_INFO, GET_LEN		
wLength		60		
Offset	Field	Size	Value	Description
0	bExecuteType	1	Number	1: Integer 2: String Must equal bParameterType of the selected option
1	dwValue	4	Number	Integer: the option value (little-endian, signed) String: the string length

5	bBuffer	55	String	String: the option value Integer: not used, 0
• GET_CUR reads the current value of the selected option. SET_CUR writes it; an integer value is limited to the option range. • The request fails if no option is selected.				

(xv) Serial Control Protocol (TR535 only)

Control Selector		UVCX_UCAM_VISCA_PROTOCOL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bProtocol	1	Number	0: VISCA (default) 1: Pelco-P 2: Pelco-D 3: Panasonic AW

(xvi) Serial Control Address (TR535 only)

Control Selector		UVCX_UCAM_VISCA_ADDR		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bAddress	1	Number	Camera address MIN 1, MAX 8, DEF 1, RES 1

(xvii) Serial Control Baud Rate (TR535 only)

Control Selector		UVCX_UCAM_VISCA_BAUD		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bBaudRate	1	Number	0: 2400 1: 4800 2: 9600 (default) 3: 38400

(xviii) IR Remote Camera Selector

Control Selector		UVCX_UCAM_IR_ID		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bID	1	Number	0 – 2: IR remote camera selector 1 – 3 (default 0)

(xix) Reset

Control Selector		UVCX_UCAM_RESET		
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Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bCode	1	Number	SET_CUR: 0x5A: Restore factory default settings 0x2C: Reset the administrator password Other values: no action GET_CUR: always 0

(xx) Pan/Tilt Relative

Control Selector		UVCX_UCAM_PANTILT_RELATIVE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		4		
Offset	Field	Size	Value	Description
0	bPanRelative	1	Signed number	0: Stop 1: Right 0xFF: Left
1	bPanSpeed	1	Number	Ignored, the camera moves at maximum speed
2	bTiltRelative	1	Signed number	0: Stop 1: Up 0xFF: Down
3	bTiltSpeed	1	Number	Ignored, the camera moves at maximum speed
Same data as the UVC Camera Terminal PanTilt (Relative) Control. Moving the camera turns auto tracking off.				

(xxi) Zoom Relative

Control Selector		UVCX_UCAM_ZOOM_RELATIVE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		3		
Offset	Field	Size	Value	Description
0	bZoom	1	Signed number	0: Stop 1: Tele 0xFF: Wide
1	bDigitalZoom	1	Boolean	0 or 1
2	bSpeed	1	Number	Ignored, the camera zooms at maximum speed
Same data as the UVC Camera Terminal Zoom (Relative) Control. Zooming turns auto tracking off.				

(xxii) VISCA over IP

Control Selector		UVCX_UCAM_VISCA_OVER_IP		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bEnable	1	Boolean	0: Off 1: On (default)

(xxiii) XU API Sequence (PTZV2 / TRV3 / TR322)

Step	Request	Description
1	SET_CUR XU_API_PARAM (bParameterLength = n, bBuffer = key)	Select a camera option by its key.
2	GET_CUR XU_API_PARAM	Optional. Read back the key and bParameterType.
3	GET_CUR XU_API_EXEC	Read the current value.
4	SET_CUR XU_API_EXEC (bExecuteType = bParameterType)	Write a new value.
The selected option is kept until another SET_CUR XU_API_PARAM.		

(e) Extension Unit – AVer XU2

(i) GUID

{36693AD0-130B-11E5-B939-0800200C9A66}

(ii) AVer XU2 Selectors

Control Selector	Value	Model	In bmControls
UVCX_UCAM2_LENS_PI_POS	0x01	All	Yes
UVCX_UCAM2_AUTO_EXPOSURE	0x02	All	Yes
UVCX_UCAM2_EXPOSURE_TIME_ABSOLUTE_CONTROL	0x03	All	Yes
UVCX_UCAM2_IRIS_ABSOLUTE_CONTROL	0x05	All	Yes
UVCX_UCAM2_GAIN	0x06	All	Yes
UVCX_UCAM2_WHITE_BALANCE_COMPONENT	0x07	All	Yes
UVCX_UCAM2_AUTO_WHITE_BALANCE_COMPONENT	0x08	All	Yes
UVCX_UCAM2_SHUTTER_INDEX	0x0B	All	Yes
UVCX_UCAM2_PERIPHERAL_VER	0x0D	All	Yes
UVCX_UCAM2_AF_SCD	0x10	All	Yes
UVCX_UCAM2_WHITE_BALANCE_TEMPERATURE	0x11	All	Yes
UVCX_UCAM2_AUTO_WHITE_BALANCE_TEMPERATURE	0x12	All	Yes
UVCX_UCAM2_PRESET_MSG	0x14	All	Yes
UVCX_UCAM2_AUTO_SLEEP_TIME	0x1A	All	Yes
UVCX_UCAM2_WHITE_BALANCE_ONEPUSH	0x1D	All	Yes

(iii) Lens Position

Control Selector		UVCX_UCAM2_LENS_PI_POS		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		4		
Offset	Field	Size	Value	Description
0	wFocusPi	2	Number	Focus motor position
2	wZoomPi	2	Number	Zoom motor position
Read only. GET_MIN, GET_MAX and GET_DEF return the current position.				

(iv) Auto Exposure Mode

Control Selector		UVCX_UCAM2_AUTO_EXPOSURE		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bAutoExposureMode	1	Bitmap	0x01: Manual 0x02: Auto (default)

(v) Shutter (Absolute)

Control Selector		UVCX_UCAM2_EXPOSURE_TIME_ABSOLUTE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		4		
Offset	Field	Size	Value	Description
0	dwShutter	4	Number	Shutter speed index (not in 100 μ s units) MIN 0, MAX 21, DEF 6, RES 1
Used in manual exposure mode. TR535 rejects SET_CUR while Auto Exposure Mode is auto.				

(vi) Iris (Absolute)

Control Selector		UVCX_UCAM2_IRIS_ABSOLUTE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	wIris	2	Number	Iris index MIN 0, MAX 13, DEF 13, RES 1

(vii) Gain

Control Selector		UVCX_UCAM2_GAIN		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	wGain	2	Number	Gain level MIN 0, MAX 14, DEF 0, RES 1

(viii) White Balance Component

Control Selector		UVCX_UCAM2_WHITE_BALANCE_COMPONENT		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		4		
Offset	Field	Size	Value	Description
0	wBlue	2	Number	Blue gain MIN 0, MAX 255, DEF 128, RES 1

2	wRed	2	Number	Red gain MIN 0, MAX 255, DEF 128, RES 1
• Used when Auto White Balance Component is 6 (Manual). TR535 rejects SET_CUR in other modes.				

(ix) Auto White Balance Component

Control Selector		UVCX_UCAM2_AUTO_WHITE_BALANCE_COMPONENT		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bWhiteBalanceMode	1	Number	0: Auto (default) 1: ATW 2: Indoor 3: Outdoor 4: One Push 6: Manual

(x) Shutter Index

Control Selector		UVCX_UCAM2_SHUTTER_INDEX		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bShutter	1	Number	Shutter speed index, same value as Shutter (Absolute) MIN 0, MAX 21, DEF 6, RES 1
• TR535 rejects SET_CUR while Auto Exposure Mode is auto.				

(xi) Peripheral Version

Control Selector		UVCX_UCAM2_PERIPHERAL_VER		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		12		
Offset	Field	Size	Value	Description
0	CamVer	6	String	Camera ROM version "xx.yy", null-terminated
6	SpeakerVer	6	String	Empty string

(xii) Continuous Auto Focus

Control Selector		UVCX_UCAM2_AF_SCD		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bAfScd	1	Number	PTZV2 / TRV3 / TR322: 0 – 1 (default 1) TR535: 0 – 2 (default 1) 0: Off

(xiii) White Balance Temperature

Control Selector		UVCX_UCAM2_WHITE_BALANCE_TEMPERATURE		
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Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	wTemperature	2	Number	White balance temperature in Kelvin MIN 2800, MAX 10000, DEF 2800, RES 1

(xiv) Auto White Balance Temperature

Control Selector		UVCX_UCAM2_AUTO_WHITE_BALANCE_TEMPERATURE		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bAuto	1	Boolean	0: Manual 1: Auto (default)

(xv) On-Screen Message

Control Selector		UVCX_UCAM2_PRESET_MSG		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bPresetMsg	1	Number	0: Off 1 – 2: On (default 2)
Controls the on-screen icons shown for preset and status changes.				

(xvi) Auto Sleep Time

Control Selector		UVCX_UCAM2_AUTO_SLEEP_TIME		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bSleepTime	1	Number	Time in seconds before the camera enters sleep mode after the USB video stream stops PTZV2 / TRV3 / TR322: 10 – 255 (default 10) TR535: 0 – 255 (default 10)
The camera setting allows larger values (PTZV2 / TRV3 / TR322: up to 600; TR535: up to 1200), which this 1-byte control cannot represent. TR535: use XU5 Sleep Time.				

(xvii) White Balance One Push

Control Selector		UVCX_UCAM2_WHITE_BALANCE_ONEPUSH		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bTrigger	1	Number	SET_CUR 1: Run one-push white balance GET_*: always 1

(f) Extension Unit – AVer XU3

(i) GUID

{36692875-1BA4-4D5B-BF91-CA2965B36DFE}

(ii) AVer XU3 Selectors

Control Selector	Value	Model	In bmControls
UVCX_UCAM3_USB_SPEED	0x01	All	Yes
UVCX_UCAM3_UVC_EZOOM_SPEED	0x03	TR535	No
UVCX_UCAM3_UVC_FACE_NUM	0x07	TRV3 / TR322 / TR535	Yes
UVCX_UCAM3_UVC_LOW_LIGHT_COMP	0x0A	All	Yes
UVCX_UCAM3_EN_REMOTE_ACCESS	0x0B	All	Yes
UVCX_UCAM3_IP_ADDRESS	0x0C	All	Yes
UVCX_UCAM3_AUDIO_INPUT	0x0D	PTZV2 / TRV3 / TR322	Yes
UVCX_UCAM3_AUDIO_VOLUME	0x0E	PTZV2 / TRV3 / TR322	Yes
UVCX_UCAM3_TRACK_MODE / TRACK_UPDATE / TRACK_NUM / TRACK_ZONE	0x10 – 0x13	TRV3 / TR322	No
UVCX_UCAM3_MOVE_TO_PT	0x1D	PTZV2 / TRV3 / TR322	Yes
UVCX_UCAM3_MULTI_PRESENTER_SEL	0x1E	TRV3 / TR322	No

(iii) USB Speed

Control Selector		UVCX_UCAM3_USB_SPEED		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bUsbSpeed	1	Number	0x03: USB 3.x (SuperSpeed) 0x01: USB 2.0

(iv) Zoom Speed (TR535 only)

Control Selector		UVCX_UCAM3_UVC_EZOOM_SPEED		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bZoomSpeed	1	Number	0: Slow 1: Fast (default)

(v) People Count

Control Selector		UVCX_UCAM3_UVC_FACE_NUM		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bPeopleCount	1	Number	Number of people detected, 0 – 254

(vi) Low Light Compensation

Control Selector		UVCX_UCAM3_UVC_LOW_LIGHT_COMP		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bLowLightCompensation	1	Boolean	0: Off (default) 1: On

(vii) Video Output Interfaces

Control Selector		UVCX_UCAM3_EN_REMOTE_ACCESS		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bEnableRemoteAccess	1	Boolean	SET_CUR: 0: Output video on USB only 1: Output video on all interfaces
GET_CUR: PTZV2 / TRV3 / TR322 always return 0; TR535 returns the current setting.				

(viii) IP Address

Control Selector		UVCX_UCAM3_IP_ADDRESS		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		32		
Offset	Field	Size	Value	Description
0	IpAddress	32	String	IPv4 address of the camera, null-terminated

(ix) Audio Input

Control Selector		UVCX_UCAM3_AUDIO_INPUT		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bAudioInput	1	Number	0: Line in 1: Microphone (default)
Same setting as XU5 Audio Input.				

(x) Audio Input Volume

Control Selector		UVCX_UCAM3_AUDIO_VOLUME		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bVolume	1	Number	Audio input volume, 0 = mute MIN 0, MAX 10, DEF 5, RES 1

(xi) Move To Position

Control Selector		UVCX_UCAM3_MOVE_TO_PT		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		8		
Offset	Field	Size	Value	Description
0	dwXPos	4	Number	X position, 0 – 1919
4	dwYPos	4	Number	Y position, 0 – 1079
• SET_CUR pans and tilts the camera so that the given point of the 1920x1080 image moves to the center. • GET_CUR and GET_DEF return (960, 540).				

(xii) Multi-Presenter (TRV3 / TR322)

Control Selector		UVCX_UCAM3_MULTI_PRESENTER_SEL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	bEnabled	1	Boolean	0: Disable 1: Enable
1	bPresetId	1	Number	Preset number, 0 – 255

• Selectors marked "No" under "In bmControls" are not listed in the Extension Unit descriptor. They can be reached with raw control requests only; most UVC host drivers do not expose them.

(g) Extension Unit – AVer XU4

(i) GUID

{3669827A-C026-11EA-B3DE-0242AC130004}

(ii) AVer XU4 Selectors

Control Selector	Value	Model	In bmControls
UVCX_UCAM4_FILE_OPEN	0x0A	All	Yes
UVCX_UCAM4_FILE_LENGTH	0x0B	All	Yes
UVCX_UCAM4_FILE_DATA	0x0C	All	Yes
UVCX_UCAM4_FILE_CLOSE	0x0D	All	Yes
UVCX_UCAM4_TRK_SMART_SHOT	0x11	TRV3 / TR322 / TR535	Yes
UVCX_UCAM4_TRK_SMART_FRAMING	0x12	TRV3 / TR322 / TR535	Yes
UVCX_UCAM4_CGI_SET_TRANSFORM	0x13	All	Yes

(iii) File Open

Control Selector		UVCX_UCAM4_FILE_OPEN		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description

0	bFileId	1	Number	SET_CUR: File to open 6 – 13: Thumbnail of preset 6 – 13 (JPEG) GET_CUR: the opened file 0: No file opened (unsupported Id or file not found) 0xFF: File not ready, retry later
The thumbnail is created from the preset image when the file is opened.				

(iv) File Length

Control Selector		UVCX_UCAM4_FILE_LENGTH		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		4		
Offset	Field	Size	Value	Description
0	dwFileLength	4	Number	Size of the opened file in bytes

(v) File Data

Control Selector		UVCX_UCAM4_FILE_DATA		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		60		
Offset	Field	Size	Value	Description
0	bData	60	Binary	Next 60 bytes of the opened file. The last block is padded with 0.

(vi) File Close

Control Selector		UVCX_UCAM4_FILE_CLOSE		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bFileId	1	Number	SET_CUR: Closes the opened file (the value is ignored) GET_CUR: the opened file Id

(vii) Smart Shot

Control Selector		UVCX_UCAM4_TRK_SMART_SHOT		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bSmartShot	1	Boolean	0: Off (default) 1: On

(viii) Smart Framing

Control Selector		UVCX_UCAM4_TRK_SMART_FRAMING		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description

0	bSmartFraming	1	Number	0: Off 1: Smart Framing 2: Auto Framing Default: TRV3 / TR322 0, TR535 1
• Takes effect while auto tracking is on and Tracking Mode is 6 (Framing). Turning it on turns Smart Shot off.				

(ix) CGI Set Transform

Control Selector		UVCX_UCAM4_CGI_SET_TRANSFORM		
Mandatory Requests		SET_CUR, GET_CUR, GET_INFO, GET_LEN		
wLength		62		
Offset	Field	Size	Value	Description
0	bType	1	ASCII	SET_CUR: 0x30 ('0'): Get command (the response is kept for reading) 0x31 ('1'): Set command GET_CUR: always 0x30
1	bAck	1	ASCII	SET_CUR with bType = 0x31: 0x30 ('0'): Complete command in this block 0x31 ('1'): More command blocks follow 0x32 ('2'): Last command block GET_CUR: 0x30 ('0'): Last response block 0x31 ('1'): More response blocks follow
2	bData	60	String	SET_CUR: Command string, null-terminated GET_CUR: Next block of the response (PTZV2 / TRV3 / TR322: up to 58 bytes; TR535: up to 60 bytes)
• The command string is the CGI request path and query, relative to the camera's HTTP root (without "http://" and host). The camera executes it on its local web server with the administrator account. Refer to the CGI command document of each model for the available commands. • A Get command (bType = 0x30) must fit in one block. A Set command longer than one block is split into blocks: send 0x31 for every block except the last, and 0x32 for the last block. The command runs after the block marked 0x30 or 0x32. • Only a Get command keeps the response. The response is limited to 10 KB.				

(x) File Read Sequence

Step	Request	Description
1	SET_CUR FILE_OPEN (bFileId)	Open the file.
2	GET_CUR FILE_OPEN	Check the opened file. Retry while 0xFF.
3	GET_CUR FILE_LENGTH	Get the file size.
4	GET_CUR FILE_DATA (repeat)	Read the file in 60-byte blocks.
5	SET_CUR FILE_CLOSE	Close the file.

(xi) CGI Transform Sequence

Step	Request	Description
1	SET_CUR CGI_SET_TRANSFORM (bType = 0x30, bAck = 0x30, bData = command)	Send a Get command. The camera runs it and keeps the response.
2	GET_CUR CGI_SET_TRANSFORM (repeat)	Read the response block by block until bAck = 0x30.
3	SET_CUR CGI_SET_TRANSFORM (bType = 0x31, bAck = 0x30 / 0x31 / 0x32)	Send a Set command, in one or more blocks.

(h) Extension Unit – AVer XU5

(i) GUID

{36694F5D-E1EE-4A73-9B9C-08393E01FBFD}

(ii) AVer XU5 Selectors

Control Selector	Value	Model	In bmControls
UVCX_UCAM5_AUDIO_INPUT	0x02	All	Yes
UVCX_UCAM5_AUTO_TRACKING	0x04	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_TRACK_MODE	0x05	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_TRACK_UPDATE	0x06	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_TRACK_NUM	0x07	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_TRACK_ZONE	0x08	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_UVC_PAN_SPEED	0x09	TR535	No
UVCX_UCAM5_UVC_TILT_SPEED	0x0A	TR535	No
UVCX_UCAM5_UVC_PRESET_SPEED	0x0B	TR535	No
UVCX_UCAM5_UVC_FREEZE_WHILE_PRESET	0x0C	TR535	No
UVCX_UCAM5_UVC_TRACKING_SENSITIVITY	0x0D	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_UVC_TRACKING_LOST_TIME	0x0E	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_UVC_PRESENTER_PEOPLE_SIZE	0x0F	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_UVC_ZONE_BLOCK_NUM	0x10	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_UVC_SLEEP_TIME	0x12	TR535	No
UVCX_UCAM5_UVC_FACTORY_RESET	0x15	TR535	No
UVCX_UCAM5_UVC_TRACKING_POINT	0x17	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_UVC_MODEL_NAME	0x18	All	Yes
UVCX_UCAM5_UVC_SERIAL_NUM	0x19	All	Yes
UVCX_UCAM5_UVC_ETH_MAC_ADDR	0x1A	All	Yes
UVCX_UCAM5_UVC_PTZ_GO_HOME	0x1B	TR535	No
UVCX_UCAM5_AUTO_ZOOM	0x1C	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_EFFECTIVE_TRACKING AREA_EN	0x1D	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_EFFECTIVE_TRACKING AREA_START	0x1E	TRV3 / TR322 / TR535	Yes
UVCX_UCAM5_EFFECTIVE_TRACKING AREA	0x1F	TRV3 / TR322 / TR535	Yes

(iii) Audio Input

Control Selector		UVCX_UCAM5_AUDIO_INPUT		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bAudioInput	1	Number	0: Line in 1: Microphone (default)

(iv) Auto Tracking

Control Selector		UVCX_UCAM5_AUTO_TRACKING		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bAutoTracking	1	Boolean	0: Off 1: On (default)

(v) Tracking Mode

Control Selector		UVCX_UCAM5_TRACK_MODE		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bTrackingMode	1	Number	1: Presenter (default) 2: Zone 3: Hybrid 6: Framing (TRV3 / TR322)

(vi) Tracking Update

Control Selector		UVCX_UCAM5_TRACK_UPDATE		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bTrackingUpdate	1	Number	SET_CUR 1: Update the list of detected targets GET_CUR: always 0
• See (xxvi) Click Tracking Sequence.				

(vii) Tracking Detect Number

Control Selector		UVCX_UCAM5_TRACK_NUM		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	bTrackingNum	1	Number	GET_CUR: Number of detected targets
1	bTrackingFocusId	1	Number	GET_CUR: Index of the tracked target SET_CUR: Index of the target to read with Tracking Zone

(viii) Tracking Zone

Control Selector		UVCX_UCAM5_TRACK_ZONE		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		16		
Offset	Field	Size	Value	Description
0	dwXPos	4	Number	X position
4	dwYPos	4	Number	Y position

8	dwWidth	4	Number	Width
12	dwHeight	4	Number	Height
• GET_CUR: the area of the target selected by bTrackingFocusId, scaled by 1.5 from 1920x1080 coordinates. • SET_CUR: switches tracking to the target in the given area, in 1920x1080 coordinates.				

(ix) Pan Speed (TR535 only)

Control Selector		UVCX_UCAM5_UVC_PAN_SPEED		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bPanSpeed	1	Number	MIN 1, MAX 24, DEF 16, RES 1

(x) Tilt Speed (TR535 only)

Control Selector		UVCX_UCAM5_UVC_TILT_SPEED		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bTiltSpeed	1	Number	MIN 1, MAX 24, DEF 16, RES 1

(xi) Preset Speed (TR535 only)

Control Selector		UVCX_UCAM5_UVC_PRESET_SPEED		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bPresetSpeed	1	Number	MIN 0, MAX 8, DEF 5, RES 1

(xii) Video Freeze while Preset (TR535 only)

Control Selector		UVCX_UCAM5_UVC_FREEZE_WHILE_PRESET		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bFreeze	1	Boolean	0: Off (default) 1: On

(xiii) Tracking Sensitivity

Control Selector		UVCX_UCAM5_UVC_TRACKING_SENSITIVITY		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bTrackingSensitivity	1	Number	MIN 1, MAX 3, DEF 2, RES 1

(xiv) Time of Return to Tracking Point

Control Selector		UVCX_UCAM5_UVC_TRACKING_LOST_TIME		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	wTrackingLostTime	2	Number	Time in seconds before the camera returns to the tracking point after losing the target MIN 3, MAX 10, DEF 3, RES 1

(xv) People Size for Presenter Mode

Control Selector		UVCX_UCAM5_UVC_PRESENTER_PEOPLE_SIZE		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bPeopleSize	1	Number	1: Full 2: Half (default)

(xvi) Block Number for Zone Mode

Control Selector		UVCX_UCAM5_UVC_ZONE_BLOCK_NUM		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bBlockNum	1	Number	Number of zones MIN 2, MAX 4, DEF 2, RES 1

(xvii) Sleep Time (TR535 only)

Control Selector		UVCX_UCAM5_UVC_SLEEP_TIME		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	wSleepTime	2	Number	Time in seconds before the camera enters sleep mode after the USB video stream stops, 0 = never MIN 0, MAX 1200, DEF 10, RES 1

(xviii) Factory Reset (TR535 only)

Control Selector		UVCX_UCAM5_UVC_FACTORY_RESET		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bReset	1	Number	SET_CUR 1: Restore factory default settings GET_*: always 1

(xix) Tracking Point

Control Selector		UVCX_UCAM5_UVC_TRACKING_POINT		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	wTrackingPoint	2	Number	Preset used as the tracking point MIN 6, MAX 9, DEF 6, RES 1

(xx) Model Name

Control Selector		UVCX_UCAM5_UVC_MODEL_NAME		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		60 (TR535: string length + 1)		
Offset	Field	Size	Value	Description
0	Name	60	String	Model name, null-terminated

(xxi) Serial Number

Control Selector		UVCX_UCAM5_UVC_SERIAL_NUM		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		60		
Offset	Field	Size	Value	Description
0	baSerialNum	60	String	Serial number, null-terminated

(xxii) Ethernet MAC Address

Control Selector		UVCX_UCAM5_UVC_ETH_MAC_ADDR		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		60 (TR535: string length + 1)		
Offset	Field	Size	Value	Description
0	MacAddr	60	String	Ethernet MAC address, null-terminated

(xxiii) PTZ Go Home (TR535 only)

Control Selector		UVCX_UCAM5_UVC_PTZ_GO_HOME		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bGoHome	1	Number	SET_CUR 1: Move the camera to the home position

(xxiv) Auto Zoom

Control Selector		UVCX_UCAM5_AUTO_ZOOM		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description

0	bAutoZoom	1	Boolean	0: Off 1: On (default)
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(xxv) Effective Tracking Area Enable

Control Selector		UVCX_UCAM5_EFFECTIVE_TRACKING_AREA_EN		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bEffectAreaEn	1	Boolean	0: Off (default) 1: On

(xxvi) Effective Tracking Area Start

Control Selector		UVCX_UCAM5_EFFECTIVE_TRACKING_AREA_START		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bEffectAreaStart	1	Boolean	0: Off (default) 1: On

(xxvii) Effective Tracking Area

Control Selector		UVCX_UCAM5_EFFECTIVE_TRACKING_AREA		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		16		
Offset	Field	Size	Value	Description
0	dwXPos	4	Number	MIN 0, MAX 1920, DEF 480, RES 1
4	dwYPos	4	Number	MIN 0, MAX 1080, DEF 270, RES 1
8	dwWidth	4	Number	MIN 0, MAX 1920, DEF 960, RES 1
12	dwHeight	4	Number	MIN 0, MAX 1080, DEF 540, RES 1
Area in 1920x1080 coordinates. SET_CUR also saves the area.				

(xxviii) Click Tracking Sequence

Step	Request	Description
1	SET_CUR TRACK_UPDATE (1)	Update the list of detected targets.
2	GET_CUR TRACK_NUM	Get the number of targets and the tracked target index.
3	SET_CUR TRACK_NUM (bTrackingFocusId)	Select the target to read.
4	GET_CUR TRACK_ZONE	Read the area of the selected target.
5	SET_CUR TRACK_ZONE (area)	Track the target in the given area.

(i) Extension Unit – AVer XU6 (TR535 only)

(i) GUID

{36696FB5-0FB3-4843-AA6B-E4780B5BBFF5}

(ii) AVer XU6 Selectors

Control Selector	Value	Model	In bmControls
UVCX_UCAM6_SYSTEM_REBOOT	0x09	TR535	Yes

(iii) System Reboot

Control Selector	UVCX_UCAM6_SYSTEM_REBOOT			
Mandatory Requests	SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN			
wLength	1			
Offset	Field	Size	Value	Description
0	bReboot	1	Number	SET_CUR 1: Restart the camera MIN 0, MAX 1, DEF 0, RES 1

(j) Extension Unit – Zoom Camera Control

(i) GUID

{A8BD5DF2-1A98-474E-8DD0-D92672D194FA}

(ii) Zoom Selectors

Control Selector	Value	Model	In bmControls
ZOOM_XU_AUTO_FRAMING_AVAILABLE	0x01	All	Yes
ZOOM_XU_PRESET_NUMBER	0x03	All	Yes
ZOOM_XU_SET_PRESET	0x04	All	Yes
ZOOM_XU_GOTO_PRESET	0x05	All	Yes
ZOOM_XU_AI_VIDEO_MODE_AVAILABLE	0x09	All	Yes
ZOOM_XU_AI_VIDEO_MODE_CONTROL	0x0A	TRV3 / TR322 / TR535	Yes

(iii) Auto Framing Available

Control Selector	ZOOM_XU_AUTO_FRAMING_AVAILABLE			
Mandatory Requests	GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN			
wLength	1			
Offset	Field	Size	Value	Description
0	bAvailable	1	Boolean	Always 0: Not available

(iv) Preset Number

Control Selector	ZOOM_XU_PRESET_NUMBER			
Mandatory Requests	GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN			
wLength	1			
Offset	Field	Size	Value	Description
0	bPresetNumber	1	Number	Number of presets: 255

(v) Set Preset

Control Selector	ZOOM_XU_SET_PRESET			
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Mandatory Requests		SET_CUR, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bPreset	1	Number	Saves the current position to camera preset (bPreset + 1)

(vi) Go To Preset

Control Selector		ZOOM_XU_GOTO_PRESET		
Mandatory Requests		SET_CUR, GET_INFO, GET_LEN		
wLength		1		
Offset	Field	Size	Value	Description
0	bPreset	1	Number	Recalls camera preset (bPreset + 1)
- Recalling a preset that has not been saved fails. - Zoom presets are numbered from 0; XU1 Preset uses the camera preset number directly.				

(vii) AI Video Mode Available

Control Selector		ZOOM_XU_AI_VIDEO_MODE_AVAILABLE		
Mandatory Requests		GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	bCamera	1	Bitmap	D3: Presenter focus (TRV3 / TR322 / TR535) Other bits: 0
1	bAudio	1	Bitmap	Always 0

(viii) AI Video Mode Control

Control Selector		ZOOM_XU_AI_VIDEO_MODE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_DEF, GET_RES, GET_INFO, GET_LEN		
wLength		2		
Offset	Field	Size	Value	Description
0	bCamera	1	Bitmap	D3: Presenter focus (auto tracking) on/off
1	bAudio	1	Bitmap	Not used, 0

4. Audio

(1) USB Audio Class

All models provide a USB Audio Class 1.0 microphone (device to host), without a speaker. The audio format is 48 kHz, 2 channels, 16-bit PCM on an isochronous endpoint. The Feature Unit has Mute and Volume controls on the master channel.

(a) Feature Unit

(i) Mute Control

Control Selector		MUTE_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR (TR535: also GET_MIN, GET_MAX, GET_RES)		
wLength		1		
Offset	Field	Size	Value	Description
0	bMute	1	Boolean	The setting for the addressed Mute Control's CUR attribute. Muted when TRUE, not muted when FALSE.
The Mute setting is stored and can be read back with GET_CUR, but it does not affect the audio sent to the host.				

(ii) Volume Control

Control Selector		VOLUME_CONTROL		
Mandatory Requests		SET_CUR, GET_CUR, GET_MIN, GET_MAX, GET_RES		
wLength		2		
Offset	Field	Size	Value	Description
0	wVolume	2	Number	The setting for the attribute of the addressed Volume Control, in 1/256 dB steps: 0x7FFF: 127.9961 dB ... 0x0100: 1.0000 dB ... 0x0000: 0.0000 dB 0xFFFF: -0.0039 dB ... 0xFE00: -1.0000 dB ... 0x8001: -127.9961 dB 0x8000: $-\infty$ dB (CUR attribute only)

Feature Unit	Default	MIN	MAX
PTZV2 / TRV3 / TR322 Microphone	0x0600 (+6 dB)	0x0180 (+1.5 dB)	0x0D80 (+13.5 dB)
TR535 Microphone	0x0200 (+2 dB)	0xF400 (-12 dB)	0x0600 (+6 dB)
- The Volume setting is stored and can be read back with GET_CUR, but it does not affect the audio sent to the host. The camera audio input source and level are set with XU5 Audio Input and, on PTZV2 / TRV3 / TR322, XU3 Audio Input Volume. - GET_RES: PTZV2 / TRV3 / TR322 0x0180 (1.5 dB), TR535 0x0001.			

5. Reference

(1) USB Video Class v1.1

<https://usb.org/document-library/video-class-v11-document-set>

(2) Audio Device Class Spec for Basic Audio Devices v1.0

<https://usb.org/document-library/audio-device-class-spec-basic-audio-devices-v10-and-adopters-agreement>