

Camera Access Protocol (CAP) Version 1.3

for

ALEXA SXT/LF/65 , AMIRA, ALEXA Mini & Mini LF

TECHNICAL INFORMATION

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1 Introduction

The Camera Access Protocol (CAP) is used to control and monitor the ARRI cameras via a network connection. The protocol incorporates functions to perform color grading, query and set variables such as the exposure index, start and stop a recording and much more. It is currently available for the ALEXA SXT, ALEXA LF, ALEXA 65, ALEXA Mini, ALEXA Mini LF and AMIRA camera lines.

2 Available CAP Features

Note that not all functions are available on all camera models. (for availability see column ALEXA SXT/LF/65 and ALEXA Mini/AMIRA)

2.1 List of Commands

Nr.	NAME	CAP Version	ALEXA SXT/LF/65	ALEXA Mini/Mini LF /AMIRA
1	Live	0.9	SUP 1.0 and later	SUP 5.0 and later
2	RequestPwdChallenge	0.9	SUP 1.0 and later	SUP 5.0 and later
3	Password	0.9	SUP 1.0 and later	SUP 5.0 and later
4	ClientName	0.9	SUP 1.0 and later	SUP 5.0 and later
5	RequestVariables	0.9	SUP 1.0 and later	SUP 5.0 and later
6	Un-RequestVariables	0.9	SUP 1.0 and later	SUP 5.0 and later
7	SetVariable	0.9	SUP 1.0 and later	SUP 5.0 and later
8	Welcome	0.9	SUP 1.0 and later	SUP 5.0 and later
9	GetFrameGrab	0.9	SUP 1.0 and later	SUP 5.0 and later
10	Get3DLutFile	0.9	SUP 1.0 and later	SUP 5.0 and later
11	Set3DLutFile	0.9	SUP 1.0 and later	SUP 5.0 and later
12	Get3DLutData	0.9	SUP 1.0 and later	SUP 5.0 and later
13	Set3DLutData	0.9	SUP 1.0 and later	SUP 5.0 and later

14	SaveLookFile	0.9	SUP 1.0 and later	SUP 5.0 and later
15	GetVariable	0.9	SUP 1.0 and later	SUP 5.0 and later
16	ImgCompareUpload	0.9	SUP 1.0 and later	not available
17	ImgCompareSwitch	0.9	SUP 1.0 and later	not available
18	AutoWhiteBalance	1.0	no	SUP 5.1 and later
19	RecordStart	1.0	no	SUP 5.1 and later
20	RecordStop	1.0	no	SUP 5.1 and later
21	StopMotionTrigger	1.0	no	SUP 5.1 and later
22	LoadSetupFile	1.0	no	SUP 5.1 and later
23	LoadLookFile	1.0	no	SUP 5.1 and later
24	PlaybackEnter	1.1	no	SUP 5.3 and later
25	PlaybackExit	1.1	no	SUP 5.3 and later
26	PlaybackStart	1.1	no	SUP 5.3 and later
27	PlaybackPause	1.1	no	SUP 5.3 and later
28	PlaybackClipSkip	1.1	no	SUP 5.3 and later
29	PlaybackShuttle	1.1	no	SUP 5.3 and later
30	PlaybackSpeed	1.1	no	SUP 5.3 and later
31	InstallLookFile from Lool Library	1.1	no	SUP 5.3 and later
32	Access to camera alerts & events	1.1	no	SUP 5.3 and later
33	ClearMessageEvent	1.1	no	SUP 5.3 and later
34	GetClipList	1.1	no	SUP 5.3 and later
35	Generate ALE Clip List from medium	1.1	no	SUP 5.3 and later
36	DeleteLookFile	1.2	no	SUP 6.0 and later
37	CompleteALE	1.2	no	SUP 6.0 and later
38	LoadFrameline	1.3	no	SUP 6.1 and later
39	UnloadFrameline	1.3	no	SUP 6.1 and later
40	AddFrameline	1.3	no	SUP 6.1 and later
41	DeleteFrameline	1.3	no	SUP 6.1 and later
42	GetSetupFile	1.3	no	SUP 6.1 and later
43	AddSetupFile	1.3	no	SUP 6.1 and later
44	AddSensorFPS	1.3	no	SUP 6.1 and later
45	DeleteSensorFPS	1.3	no	SUP 6.1 and later
46	AddShutter	1.3	no	SUP 6.1 and later
47	DeleteShutter	1.3	no	SUP 6.1 and later

48	AddExposureTime	1.3	no	SUP 6.1 and later
49	DeleteExposureTime	1.3	no	SUP 6.1 and later
50	AddWhiteBalance	1.3	no	SUP 6.1 and later
51	DeleteWhiteBalance	1.3	no	SUP 6.1 and later
52	AudioLevelMode	1.3	no	SUP 6.1 and later
53	AudioGain	1.3	no	SUP 6.1 and later

2.2 List of Variables

Nr.	NAME	CAP Version	Read mode	Remarks	ALEXA SXT/LF/65	ALEXA Mini/Mini LF /AMIRA
1	Camera Type	0.9	read only	"Alexa SXT"	SUP 1.0 and later	SUP 5.0 and later
2	Camera Serial	0.9	read only	"6002"	SUP 1.0 and later	SUP 5.0 and later
3	Camera State	0.9	read only	Bitfield with CameraState enum bits	SUP 1.0 and later	SUP 5.0 and later
4	Look Filename	0.9	read only	w/o .ending	SUP 1.0 and later	SUP 5.0 and later
5	CDL Values	0.9		List of 10x F32	SUP 1.0 and later	SUP 5.0 and later
6	Color Temperature	0.9		WhiteBalance [Kelvin]	SUP 1.0 and later	SUP 5.0 and later
7	Tint	0.9		WhiteBalance Tint Value	SUP 1.0 and later	SUP 5.0 and later
8	Exposure Index	0.9		EI in Asa, see Exposure Index List for possible values	SUP 1.0 and later	SUP 5.0 and later
9	LookSwitch EVF	0.9		LookSwitch (table 8)	SUP 1.0 and later	SUP 5.0 and later
10	Look Switch Mon1	0.9			SUP 1.0 and later	SUP 5.0 and later
11	Look Switch Mon2	0.9			SUP 1.0 and later	SUP 5.0 and later
12	Look Switch Mon3	0.9			SUP 1.0 and later	SUP 5.0 and later
13	Sensor FPS List	1.0	read only	Each array element consists of a single F32, read-only	no	SUP 5.1 and later
14	Sensor FPS	1.0		Is not required to be contained in Sensor FPS List	no	SUP 5.1 and later

15	Shutter Angle List	1.0	read only	Each array element consists of a single F32, read-only	no	SUP 5.1 and later
16	Shutter Angle	1.0		Is not required to be contained in Shutter Angle List	no	SUP 5.1 and later
17	Exposure Time List	1.0	read only	Each array element consists of a single F32, read-only	no	SUP 5.1 and later
18	Exposure Time	1.0		Is not required to be contained in Exposure Time List	no	SUP 5.1 and later
19	Exposure Index List	1.0	read only	Each array element consists of a single U32, read-only	no	SUP 5.1 and later
20	ND Filter List	1.0	read only	Each array element consists of a single U16, read-only	no	SUP 5.1 and later
21	ND Filter	1.0		Optical density, see ND Filter List for possible values	no	SUP 5.1 and later
22	White Balance List	1.0	read only	Each array element consists of a triple (CCT in Kelvin: F32, Tint: F32, Name: string), read-only	no	SUP 5.1 and later
23	Focus Tool Mon	1.0		Each array element – one per Mon out – consists of a single bool, writeable	no	SUP 5.1 and later
24	Exposure Tool Mon	1.0		Each array element – one per Mon out – consists of a single bool, writeable	no	SUP 5.1 and later
25	Test Image	1.0		TestImage (table 11)	no	SUP 5.1 and later
26	Media Status	1.0	read only	See section 7.1.5	no	SUP 5.1 and later
27	User Setup List	1.0	read only	Each array element – one per internally stored setup file – consists of a single string containing the name of the file	no	SUP 5.1 and later
28	Look File List	1.0	read only	Each array element – one per internally stored look file – consists of a single string containing the name of the file	no	SUP 5.1 and later

29	Recording Mode	1.0		RecordingMode (table 14)	no	SUP 5.1 and later
30	Camera Index	1.0		Value corresponding to the index letter assigned to the camera, Value Range A-Z (A= 0 -- Z = 25)	no	SUP 5.2 and later
31	Mon Processed	1.0		Each array element consists of a single bool, read-only	no	SUP 5.2 and later
32	SDI In Mode	1.0		SDI_InMode (table 16)	no	SUP 5.2 and later
33	Tally State	1.0		TallyState (table 17)	no	SUP 5.2 and later
34	Exposure Unit	1.0		ExposureUnit (table 15)	no	SUP 5.2 and later
35	Current Date	1.1		Always in the following system time format: "YYYY-MM-DD HH:MM:SS"	no	SUP 5.3 and later
36	Project Rate	1.1		ProjectRate (table 7). Enumeration value symbols ending with 'I' (e.g. PR_59940i) represent interlaced frame rates.	no	SUP 5.3 and later
37	Active Alert States	1.1	read only	Bitset of active alert states, read-only. See section 8.1.3 "Active Alert States"	no	SUP 5.3 and later
38	Active Message Events	1.1	read only	Each array element consists of a pair (event ID: U16, message text: string). Read-only.	no	SUP 5.3 and later
39	Active Medium	1.1		The ID is the index into the array exposed through variable Media Status (0x006d) or 0xffff if no active Medium is present.	no	SUP 5.3 and later
40	Timecode	1.1		BCD timecode: HHMMSSFF	no	SUP 5.3 and later
41	Timecode Offset	1.1		User-configurable timecode offset	no	SUP 5.3 and later
42	Timecode Run Mode	1.1		TC_RunMode (table 18).	no	SUP 5.3 and later
43	Timecode Init Mode	1.1		TC_InitMode (table 19).	no	SUP 5.3 and later

44	Timecode Drop Mode	1.1		Drop frame mode flag	no	SUP 5.3 and later
45	Last REC Medium	1.1	read only	ID of the medium containing the last recorded clip. Useful in combination with Last REC Clip ID. Read-only.	no	SUP 5.3 and later
46	Last REC Clip Index	1.1	read only	Index of the last recorded clip. Useful in combination with Last REC Medium ID to be fed into command GetClipList (0x00a4). Read-only.	no	SUP 5.3 and later
47	Lens Model	1.1	read only	Model of the attached lens.	no	SUP 5.3 and later
48	Lens Serial Number	1.1	read only	Serial number of the attached lens.	no	SUP 5.3 and later
49	Lens Focus	1.1	read only	Lens focus distance in mm, 0 for invalid/unknown, -1 for infinity.	no	SUP 5.3 and later
50	Lens Iris	1.1	read only	Lens iris value in 1/1000th stops, with 1000 = T1, -1 for invalid, -2 for closed and -3 for near closed iris.	no	SUP 5.3 and later
51	Lens focal length	1.1	read only	Lens zoom (focal length) in 1/1000th mm, 0 for invalid/unknown	no	SUP 5.3 and later
52	Clip Scene	1.1		Descriptive metadata item for maximum 16 characters	no	SUP 5.3 and later
53	Clip Take	1.1		Descriptive metadata item for maximum 08 characters	no	SUP 5.3 and later
54	Production	1.1		Descriptive metadata item for maximum 32 characters	no	SUP 5.3 and later
55	Production Company	1.1		Descriptive metadata item for maximum 32 characters	no	SUP 5.3 and later
56	Director	1.1		Descriptive metadata item for maximum 32 characters	no	SUP 5.3 and later

57	Cinematographer	1.1		Descriptive metadata item for maximum 32 characters	no	SUP 5.3 and later
58	Camera Operator	1.1		Descriptive metadata item for maximum 32 characters	no	SUP 5.3 and later
59	Location	1.1		Descriptive metadata item for maximum 64 characters	no	SUP 5.3 and later
60	User Info 1	1.1		Descriptive metadata item for maximum 128 characters	no	SUP 5.3 and later
61	User Info 2	1.1		Descriptive metadata item for maximum 128 characters	no	SUP 5.3 and later
62	Playback clip Index	1.2	read only	This variable returns the index of the clip currently in playback in in the clip list which can be retrieved via the GetClipList command.	no	SUP 6.0 and later
63	Remaining Rec Time	1.2	read only	This variable holds the remaining time to record with current settings as a count of seconds.	no	SUP 6.0 and later
64	Battery Voltage	1.2	read only	This variable holds electrical voltage of the connected battery in Volts.	no	SUP 6.0 and later
65	Battery Capacity	1.2	read only	This variable holds the remaining charge of the connected battery in percent.	no	SUP 6.0 and later
66	Main Voltage	1.3	read only	Current voltage on the main power supply connector.	no	SUP 6.1 and later
67	Current Reel	1.3	read only	Current reel count	no	SUP 6.1 and later
68	Clip Number	1.3	read only	Clip number displayed on home screen	no	SUP 6.1 and later
69	Prerecord Duration	1.3		Current Prerecord Duration	no	SUP 6.1 and later
70	Master black pedestal	1.3		Master black pedestal that offsets RGB video pedestal	no	SUP 6.1 and later
				List of 3x F32 RGB		

71	Video Pedestal	1.3		pedestals	no	SUP 6.1 and later
72	Video Slope	1.3		List of 3x F32 RGB slopes	no	SUP 6.1 and later
73	Video Gamma RGB	1.3		List of 3x F32 RGB gammas	no	SUP 6.1 and later
74	Video Knee	1.3		Active video knee in the active look	no	SUP 6.1 and later
75	Video Gamma	1.3		Active video gamma in the active look	no	SUP 6.1 and later
76	Video Saturation	1.3		Active video saturation in the active look	no	SUP 6.1 and later
77	Black Gamma	1.3		Active video black gamma in the active look	no	SUP 6.1 and later
78	Video Saturation Red	1.3		Active video saturation red in the active look	no	SUP 6.1 and later
79	Video Saturation Yellow	1.3		Active video saturation yellow in the active look	no	SUP 6.1 and later
80	Video Saturation Green	1.3		Active video saturation green in the active look	no	SUP 6.1 and later
81	Video Saturation Cyan	1.3		Active video saturation cyan in the active look	no	SUP 6.1 and later
82	Video Saturation Blue	1.3		Active video saturation blue in the active look	no	SUP 6.1 and later
83	Video Saturation Magenta	1.3		Active video saturation magenta in the active look	no	SUP 6.1 and later
84	Frameline List	1.3	read only	<p>List of available framelines in the internal storage of the camera. Array consisting of the following items per element:</p> <ul style="list-style-type: none"> • String: name of frameline file • U8: flag to indicate if the frameline can be applied with the current camera settings 	no	SUP 6.1 and later
85	Filter Sharpness	1.3		Current Filter Sharpness	no	SUP 6.1 and later
86	Audio Level Mode	1.3	read only	Array of struct (U8, U16) see section 8.6.	no	SUP 6.1 and later

87	Audio Gain	1.3	read only	Array of struct (U8, F32) see section 8.7.	no	SUP 6.1 and later
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2.3 List of Media Status Information

Nr.	NAME	CAP Version	ALEXA SXT/LF/65	ALEXA Mini/Mini LF /AMIRA
1	Medium Type	1.0	no	SUP 5.1 and later
2	Model Name	1.0	no	SUP 5.1 and later
3	Firmware Version	1.0	no	SUP 5.1 and later
4	Serial Number	1.0	no	SUP 5.1 and later
5	Medium Size	1.0	no	SUP 5.1 and later
6	Medium Status	1.0	no	SUP 5.1 and later
7	Write Protection	1.0	no	SUP 5.1 and later
8	Clip Count	1.0	no	SUP 5.1 and later
9	Current Reel	1.0	no	SUP 5.1 and later
10	Free Capacity	1.0	no	SUP 5.1 and later

2.4 List of Metadata from GetClipList

Nr.	NAME	CAP Version	ALEXA SXT/LF/65	ALEXA Mini/Mini LF /AMIRA
1	Clip Filename	1.1	no	SUP 5.3 and later
2	Clip UUID	1.1	no	SUP 5.3 and later
3	Clip Project Rate	1.1	no	SUP 5.3 and later
4	Clip Start TC	1.1	no	SUP 5.3 and later
5	Clip Duration TC	1.1	no	SUP 5.3 and later
6	Playable flag	1.3	no	SUP 6.1 and later

3 Contact

If you have any questions regarding the Camera Access Protocol (CAP) in ARRI cameras, please feel free to contact us via email at digitalworkflow@arri.de.