

KALEIDO MULTIVIEWER

KALEIDO SOFTWARE V10.20

Product Comparison Guide

M770-9904-105

2018-09-07

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Title	Kaleido multiviewer Product Comparison Guide
Part Number	M770-9904-105
Revision	2018-09-07, 15:11

Kaleido Product Comparison Charts

Product	Kaleido-XQUAD single & dual	Kaleido-X16-D Kaleido-X16-S	Kaleido-MX Kaleido-MX 4K	Kaleido Modular KMV-3911 KMV-3901	Kaleido Modular-X KMX-3901	KMX-49N1-9×2 KMX-49N1-18×4 KMX-49N1-27×4 KMX-49N1-36×4 KMX-49N1-54×4	KMX-3921-9×2 KMX-3921-18×4 KMX-3921-27×4 KMX-3921-36×4 KMX-3921-54×4	Kaleido-X (4 RU)	Kaleido-X (7 RU)	Kaleido-X (14 RU)	Kaleido-IP X320 X120	Kaleido-IP VM
Category	Compact, pre-configured, turnkey			Scalable modular				Highest layout flexibility with integrated routing				
Frame size (RU)	½	1	1 or 3					4	7	14	1	
Densité 3 mini				•	•							
Densité 3				•	•							
Densité 3+ (FR1 & FR4)					•		•					
GV Node						•						
Video inputs (total)	4 or 8 ¹	16	Up to 64	8	Up to 64	9, 18, 27, 36 or 54	9, 18, 27, 36 or 54	Up to 32	Up to 96	Up to 192	Up to 128 decoded streams ²	Up to 64 decoded streams ²
Video inputs per input module			16		16	9	9	16	16	16		
Analog video ³		•						•	•	•		
SDI ³	•	•	•	•	•	•	•	•	•	•		
IP					Uncompressed ⁴	Uncompressed ⁵					Compressed & uncompressed	Compressed
Analog audio ⁶		Up to 128	Up to 128		Up to 128			Up to 256	Up to 768	Up to 1536		
AES3 audio ⁶		Up to 128	Up to 128		Up to 128			Up to 256	Up to 768	Up to 1536		
MADI audio			Up to 64 ⁷		Up to 64 ⁷	Up to 256 ⁵	Up to 256 ⁸					
Dolby-E audio ⁹		Optional	Optional ¹⁰		Optional	Optional	Optional	Optional	Optional	Optional		
Compressed audio, except Dolby-E											• ²	• ²
Displays	Single: 1 Dual: 2	X16-S: 1 X16-D: 2	Up to 4	Up to 2	Up to 4 (2 per card)	Up to 4 (2 for the 9×2)	Up to 4 (2 for the 9×2)	Up to 4	Up to 8	Up to 12	Up to 2	0
Display rotation		•	•		•	•	•	•	•	•	•	•
Router outputs		2							Up to 48	Up to 96		
Streaming outputs					Up to 4 uncompressed ⁴	Up to 4 uncompressed (2 for the 9×2)					Up to 2	1
Cascading of multiple units		Up to 3 units for 48 inputs on 2 displays ¹¹		Up to 3 units for 24 inputs on 2 displays							With Kaleido-X16	
Images per display	Single: up to 4 ¹² Dual: up to 8	Up to 64	Up to 64 ¹³	Up to 8 (up to 24 when cascading)	Up to 64 ¹³	9, 18, 27, 36 or 54	9, 18, 27, 36 or 54	Up to 64	Up to 64	Up to 64	Up to 64	Up to 64

¹ XQUAD-DUAL has 8 inputs; XQUAD has 4 inputs plus an optional 4 with a software license.

² See Kaleido-IP decoding capability table (below) for further detail.

³ See Input signal formats table below for more details.

⁴ Using KMX-3901-IN-IP kit. See Input signal formats table below for more details.

⁵ Using GV Node to provide signals.

⁶ Using Audio Bridge Terminal (ABT). One ABT provides 64 or 128 channels, analog or digital (AES3).

⁷ MADI and Audio Bridge Terminal cannot be used simultaneously.

⁸ Each MADI connection uses up one SDI input.

⁹ Dolby-E audio level meters and metadata extraction only. No listening capability.

¹⁰ From embedded audio only. Not available with discreet audio coming from Audio Bridge Terminal.

¹¹ Can be cascaded with one Kaleido-IP to create a hybrid (SDI & compressed) monitor wall.

¹² 8 with a software license.

¹³ Up to 32 when every video window is associated with audio meters and a time code monitor. Up to 16 when a layout is used to monitor color teletext.

M770-9904-105

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Free image repetition		•	•		•			•	•	•	•	•
Image overlap (PIP)		•						•	•	•	•	
Source image cropping	•	•	•	•	•	• ¹⁴	• ¹⁴	•	•	•	•	
Multi-room	•	•	•	•	•	•	•	•	•	•	•	•
Clustering	•	•	•	•	•	•	•	•	•	•	•	•
Penalty box & channel cycling using Monitor Wall Destinations ¹⁵	•	•						•	•	•	•	•
Analog audio outputs		2	Up to 4 ¹⁶		•			Up to 4	Up to 8	Up to 12		
AES3 audio outputs		2						Up to 4	Up to 8	Up to 12		
Background input		•						•	•	•		
GPI IO/IN/OUT	0/8/2	0/32/4	8/20/0	Via GPI-1501	Via GPI-1501	Via GPI-1501	Via GPI-1501	72/0/0	72/0/0	144/0/0	Via GPI-1501	Via GPI-1501
SNMP	•	•	•	•	•			•	•	•	•	•
High Dynamic Range sources processing ¹⁷						• ¹⁸	•					
3D	•	•		•				•	•	•		
RS-422 serial port	1	2	Up to 2	1	Up to 2			Up to 2	Up to 4	Up to 6		
LTC		2	Up to 5	1 (from URS)	Up to 5 (incl. URS)	1 (from URS)	1 (from URS)	Up to 6	Up to 12	Up to 18		
Reference input		•	•	From URS	•	From URS	From URS	•	•	•		
Processing delay @ 59.94 Hz	16 to 33 ms	33 ms	33 ms	16 ms	33 ms	16 ms	16 ms	33 ms	33 ms	33 ms		
Processing delay @ 50 Hz	20 to 40 ms	40 ms	40 ms	20 ms	40 ms	20 ms	20 ms	40 ms	40 ms	40 ms		
Power consumption	24 W	250 W	150 W in 1RU 500 W in 3RU	24W	16×2: 80W 64×4: 270W	9×2: 30 W 54×4: 180 W	9×2: 30 W 54×4: 180 W	600 W	1500 W	3000 W		
DVI/HDMI output automatic resolution from display (EDID)	•	•	•	•	•			•	•	•		
Phase locked output		•	•	•	•	•	•					
Router output signal type		3G-SDI, HD-SDI, SD-SDI				3G-SDI, 2022- 6/7, 2110			HD-SDI, SD-SDI	HD-SDI, SD-SDI		
Display output connectors	HDMI 3G-SDI	HDMI 3G-SDI	4K HDMI 2.0 4x3G-SDI HDMI 1.3 3G-SDI	HDMI 3G-SDI ¹⁹	HDMI 3G-SDI	Multi-format SFP (optical, DIN, HDMI mini)	Multi-format SFP (optical, DIN, HDMI mini)	DVI RGBHV 3G-SDI ²⁰	DVI RGBHV 3G-SDI ²⁰	DVI RGBHV 3G-SDI ²⁰	DisplayPort or HDMI ²¹	
SDI Display resolutions	1280×720p 1920×1080p 1920×1080i	1280×720p 1920×1080p 1920×1080i	1280×720p 1920×1080p 1920×1080i 3840×2160 ²²	1280×720p 1920×1080p 1920×1080i	1280×720p 1920×1080p 1920×1080i 3840×2160p	1920×1080i 1920×1080p	1920×1080i 1920×1080p	1280×720p 1920×1080p ^{20, 23} 1920×1080i	1280×720p 1920×1080p ^{20, 23} 1920×1080i	1280×720p 1920×1080p ^{20, 23} 1920×1080i		

¹⁴ Horizontal only.

¹⁵ Requires [iControl Penalty Box](#).

¹⁶ Except for the 16×4 model (0)

¹⁷ See Input formats table below for more details.

¹⁸ Requires KMX-4921.

¹⁹ KMV-3901 does not have SDI outputs.

²⁰ With optional KXO-HDM module.

²¹ DisplayPort to HDMI active adapter included

²² Using quad link 1080p SDI (square division)

²³ Only with KXO-DUAL3 and KXO-DUAL3-B. Not supported on KXO-DUAL.

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DVI/HDMI Display resolutions	Up to 1920×1200	Up to 1920×1200	Up to 3840×2160 ²⁴	Up to 1920×1200	Up to 1920×1200	1920×1080i 1920×1080p 3840×2160 ²⁴	1920×1080i 1920×1080p 3840×2160 ²⁴	Up to 1920×1200	Up to 1920×1200	Up to 1920×1200	Up to 3840×2160	
Custom DVI/HDMI display resolutions	•	•	•	•	•			•	•	•	•	
DXF-4K DVI/HDMI optical extender	•	•	•	•	•			•	•	•	•	
DXF-300-F HDMI optical extender			•		•	•	•					
DXF-300-IP HDMI IP extender			•		•	•	•					

Input signal formats – Analog, SDI and uncompressed video over IP

Discontinued products are italicized.

Format			Kaleido-X 4 RU, 7 RU, 14 RU					Kaleido-X16	Kaleido-Modular		Kaleido-MX Kaleido-MX 4K Kaleido-Modular-X		<i>KMX-4911</i>	KMX-4921	KMX-3921	Kaleido-IP X320 X120
Name	Scan format	Serial interface	KXI-16HSV3	KXI-16HS3	KXI-16SV	<i>KXI-16HSV</i>	<i>KXI-16HS</i>		KMV-3911	<i>KMV-3901</i>	KMX-3901-IN	KMX-3901-IN-IP	Via GV Node	Via GV Node		
Analog 525	NTSC-N,J PAL-M		•		•	•		•								
Analog 625	PAL-B/G, I, D/K, N, SECAM		•		•	•		•								
601 525	ST 125:1995	ST 259	•	•	•	•	•	•	•	•	•	•	•	•	•	Optional
601 625	EBU Tech. 3267	ST 259	•	•	•	•	•	•	•	•	•	•	•	•	•	Optional
720p 23.98/24/29.97	ST 296	ST 292-1	•	•		•	•	•	•	•	•	•			•	
720p 30	ST 296	ST 292-1	•	•		•	•	•			•	•			•	
720p 50/59.94	ST 296	ST 292-1	•	•		•	•	•	•	•	•	•	•	•	•	Optional
720p 60	ST 296	ST 292-1	•	•		•	•	•			•	•			•	Optional
1080i 50/59.94	ST 274	ST 292-1	•	•		•	•	•	•	•	•	•	•	•	•	Optional
1080i 60	ST 274	ST 292-1	•	•		•	•	•			•	•			•	Optional
1080p 23.98/24/29.97	ST 274	ST 292-1	•	•		•	•	•	•	•	•	•			•	
1080p 30	ST 274	ST 292-1	•	•		•	•	•			•	•			•	
1080psF 50/59.94	ST 274	ST 292-1	•	•		•	•	•	•	•	•	•	•	•	•	Optional
1080psF 60	ST 274	ST 292-1	•	•		•	•	•			•	•			•	Optional
1080p 50/59.94 level A	ST 425-1	ST 424	Optional	Optional				Optional	Optional	Optional	Optional	Optional	•	•	•	Optional
1080p 50/59.94 level B-DL	ST 425-1	ST 424	Optional	Optional				Optional			Optional	Optional			•	
4K UHD (Quad Link, Square division) 25/29.97	ST 2036-1	ST 425-5									Optional ²⁵					
4K UHD (Quad Link, Square division) 50/59.94	ST 2036-1	ST 425-5									Optional ²⁵					
4K UHD (Quad Link, 2SI) 25/29.97	ST 2036-1	ST 425-5														
4K UHD (Quad Link, 2SI) 50/59.94	ST 2036-1	ST 425-5														
1080p 50/59.94 with High Dynamic Range (PQ, HLG, S-Log3)	ITU-R BT.2100	ST 424												•	•	

²⁴ With 4K HDMI 2.0 adaptor.

²⁵ One extra KMX-3901-IN card is needed for every two 4K UHD signals to input.

Kaleido-IP decoding capabilities

Numbers represent the maximum video decoding capacity when only this format is used and head streaming is disabled. Actual performance may vary according to the content’s complexity. This table and accompanying notes should only be used as general guidelines. The absolute maximum video decoding capacity is 128 streams under all conditions. Audio decoding capacity is limited only by processor usage. To achieve the numbers shown below, specialized knowledge and network equipment is required for implementation (for example, shaping traffic at the sender); contact Grass Valley for more information.

- If one head streaming is enabled, decoding capacity is reduced by 4%. If two head streaming is enabled, decoding capacity is reduced by 8%.
- Halving the bit rate increases the decoding capacity by approximately 33%. Doubling the bit rate decreases the decoding capacity by approximately 25%.
- Using H.265 with Main profile instead of Main10 increases the decoding capacity by approximately 25%.
- Using 4:2:2 instead of 4:2:0 will decrease the decoding capacity. Benchmark results are not yet available for 4:2:2.
- If uncompressed sources are mixed with compressed sources, the Kaleido-IP’s decoding capacity for compressed signals is cut half.

Video decoding capacity

Codec → Model ↓	MPEG-2 SD Main, 8 Mb/s	MPEG-2 HD Main, 20 Mb/s	H.264 SD High, 2 Mb/s	H.264 HD High, 10 Mb/s	H.265 SD Main10, 2 Mb/s	H.265 HD Main10, 5 Mb/s	H.265 1080p50/59, Main10, 5 Mb/s	H.265 4K Main10, 25 Mb/s, Main Tier	H.265 4K Main10, 125 Mb/s, High Tier
X100	24	8	12	6					
X110	48	16	24	12					
X300	64	24	32	16					
X120	128	45	84	18	64	16	10	2	1
X310	128 ²⁶	64	100	24	84	20	12	2	1
X320	128 ²⁶	90	128 ²⁶	36	128	32	20	4	3
VM	•	•	•	•	•	•	•	•	•

Format → Model ↓	2022-6/2110-20 SD	2022-6/2110-20 HD	2022-6/2110-20 1080p50/59
X100			
X110			
X300			
X120	32	24	12
X310	32	24	12
X320	32	24	12
VM			

²⁶ 128 maximum stream limit reached before machine limit.
M770-9904-105

Codec support by streaming mode

Streaming mode →		RTMP ²⁷	MPEG-DASH ^{SOON} 27,28	HLS ²⁷		Transport Stream	RTSP	RTSP/ES	RTP/ES	Uncompressed	
Protocols		RTMP	DASH	HLS rev.20 ²⁸ ^{SOON}	HLS		RTSP			SMPTE ST 2022-6	SMPTE ST 2110 ^{BETA} 28
			fMP4		MPEG-TS			Elementary stream			
Video codec	H.265/HEVC		Optional ²⁹	Optional ²⁹	Optional ²⁹	Optional ²⁹	Optional ²⁹				
	H.264/MPEG-4 AVC ³⁰	•	•	•	•	•	•	•	•		
	MPEG-4 ³¹							•	•		
	MPEG-2 ³²				•	•	•				
Audio codec ³³	AAC ³⁴ LATM				Optional	Optional	Optional				
	AAC ³⁴	Optional	Optional	Optional	Optional	Optional	Optional	Optional			
	AC-3 (Dolby Digital)		Optional	Optional	Optional	Optional	Optional	Optional			
	E-AC-3 (Dolby Digital+)		Optional	Optional	Optional	Optional	Optional				
	MPEG-1 Layer 2				•	•	•	•			
	MPEG-1 Layer 3	•			•	•	•	•			
2022-6 audio & video										Optional ³⁵	
2110-20 (RFC 4175 video)											Optional ³⁵
2110-30 (PCM audio)											Optional ³⁵
2110-31 (AES audio)											
2110-40 (Ancillary data)											Optional ³⁵

Contact Grass Valley if you have additional requirements.

²⁷ Limitations may apply depending on stream content, usage of a content delivery network and/or encryption mode. Please contact Grass Valley to submit a playlist file for reviewing.

²⁸ Please contact Grass Valley for information.

²⁹ One license is required to decode unlimited HD/SD streams and one to decode unlimited 4K streams.

³⁰ Streams encoded only with P-frames are not supported.

³¹ MPEG-4 Part 2 (MPEG-4 Visual) decoding capacity is identical to H.264.

³² Including unencrypted Digicipher 2 (DCII).

³³ Up to 48kHz. Some limitations apply when the sample rate is different than 48kHz.

³⁴ Including LC-AAC, HE-AAC (SBR) & HE-AACv2 (SBR+PS).

³⁵ One license is required to decode uncompressed audio, video & ancillary streams. Also requires an optional high bit rate network card.



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