



Maximum Number of Full-Frame Channels

Supported by GV-Control Center

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Applied to

GV-Control Center V4.0.1

GV-VMS V17.4.3

Summary

This technical notice examines the performance data of GV-Control Center V4.0.1 where IP channels of various resolutions from GV-VMS are displayed with different layouts. The Live View layouts were tested at 1920 x 1080 / 3840 x 2160 screen resolution. The CPU usage was around 70% when the performance tests were carried out.

The performance data were obtained using H.264 and H.265 GPU decoding. Decoding is added to lower the CPU loading and to increase the maximum frame rate. For more details, refer to *1. GPU Decoding Specifications* in this document.

Additionally, video data from GV-VMS / NVR is compressed before being sent to GV-Control Center in the performance testing.

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1. GPU Decoding Specifications

To perform H.265 GPU decoding, your computer must meet the following specifications:

Codec		H.264		H.265	
GPU		2 nd Gen	3 rd -4 th Gen	6 th Gen	7 th -11 th Gen
OS	64-Bit	Windows 8 / 8.1 / 10 / Server 2012 R2			Windows 10
Resolution		1 MP / 2 MP	1 MP / 2 MP / 3 MP / 4 MP / 5 MP / 8 MP / 12 MP	1 MP / 2 MP / 3 MP / 4 MP / 5 MP	
Graphics Card		On-board VGA			

2. Maximum Number of Channels Supported by GV-Control Center

The tables in this section present the maximum number of IP channels supported by GV-Control Center from GV-VMS in Live View, each with a different proportional layout.

1 x 1 layout

Host	Codec	Monitor	Resolution			Total FPS Supported	Full-Frame Channels Supported
			Megapixel	Main Stream	Sub Stream		
GV-VMS	Main: H.265	Full HD (1920 x 1080)	2 MP (30 fps)	1920 x 1080	640 x 360	270	9 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	240	8 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	180	9 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	180	9 CH
	Sub: H.264	4K (3840 x 2160)	2 MP (30 fps)	1920 x 1080	640 x 360	60	2 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	60	2 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	60	3 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	60	3 CH

Note: By default, video data from GV-VMS / NVR is compressed.



2 x 2 layout

Host	Codec	Monitor	Resolution			Total FPS Supported	Full-Frame Channels Supported
			Megapixel	Main Stream	Sub Stream		
GV-VMS	Main: H.265	Full HD (1920 x 1080)	2 MP (30 fps)	1920 x 1080	640 x 360	1080	36 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	1080	36 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	720	36 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	720	36 CH
	Sub: H.264	4K (3840 x 2160)	2 MP (30 fps)	1920 x 1080	640 x 360	480	16 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	360	12 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	320	16 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	320	16 CH

Note: By default, the video data from GV-VMS / NVR is compressed.

3 x 3 layout

Host	Codec	Monitor	Resolution			Total FPS Supported	Full-Frame Channels Supported
			Megapixel	Main Stream	Sub Stream		
GV-VMS	Main: H.265	Full HD (1920 x 1080)	2 MP (30 fps)	1920 x 1080	640 x 360	2430	81 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	2430	81 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	1620	81 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	1620	81 CH
	Sub: H.264	4K (3840 x 2160)	2 MP (30 fps)	1920 x 1080	640 x 360	1080	36 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	540	18 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	360	18 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	360	18 CH

Note: By default, the video data from GV-VMS / NVR is compressed.



4 x 4 layout

Host	Codec	Monitor	Resolution			Total FPS Supported	Full-Frame Channels Supported
			Megapixel	Main Stream	Sub Stream		
GV-VMS	Main: H.265	Full HD (1920 x 1080)	2 MP (30 fps)	1920 x 1080	640 x 360	4320	144 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	4320	144 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	2880	144 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	1920	96 CH
	Sub: H.264	4K (3840 x 2160)	2 MP (30 fps)	1920 x 1080	640 x 360	1920	64 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	1920	64 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	2880	144 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	1280	64 CH

Note: By default, the video data from GV-VMS / NVR is compressed.

6 x 6 layout

Host	Codec	Monitor	Resolution			Total FPS Supported	Full-Frame Channels Supported
			Megapixel	Main Stream	Sub Stream		
GV-VMS	Main: H.265	Full HD (1920 x 1080)	2 MP (30 fps)	1920 x 1080	640 x 360	6480	216 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	6480	216 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	5040	252 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	5040	252 CH
	Sub: H.264	4K (3840 x 2160)	2 MP (30 fps)	1920 x 1080	640 x 360	2160	72 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	2160	72 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	4320	216 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	2160	108 CH

Note: By default, the video data from GV-VMS / NVR is compressed.



8 x 8 layout

Host	Codec	Monitor	Resolution			Total FPS Supported	Full-Frame Channels Supported
			Megapixel	Main Stream	Sub Stream		
GV-VMS	Main: H.265	Full HD (1920 x 1080)	2 MP (30 fps)	1920 x 1080	640 x 360	7680	256 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	7680	256 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	6400	320 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	5120	256 CH
	Sub: H.264	4K (3840 x 2160)	2 MP (30 fps)	1920 x 1080	640 x 360	3840	128 CH
			4 MP (30 fps)	2688 x 1520	640 x 360	3840	128 CH
			8 MP (20 fps)	3840 x 2176	640 x 360	5120	256 CH
			8 MP (20 fps)	3840 x 2176	1280 x 720	3840	192 CH

Note: By default, the video data from GV-VMS / NVR is compressed.



3. Testing Environment

The performance tests were carried out using the following bitrates and test PC.

Bitrate used for the test		
Resolution / Codec	H.265	H.264
	Main Stream	Sub Stream
2 MP (30 fps)	1920 x 1080 (1.6 Mbit/s)	640 x 360 (0.84 Mbit/s)
4 MP (25 fps)	2560 x 1440 (7.87 Mbit/s)	640 x 360 (1.72 Mbit/s)
4 MP (30 fps)	2688 x 1520 (2.78 Mbit/s)	640 x 360 (0.94 Mbit/s)
8 MP (20 fps)	3840 x 2176 (3.52 Mbit/s)	640 x 360 (1.24 Mbit/s)
8 MP (20 fps)	3840 x 2176 (3.52 Mbit/s)	1280 x 720 (1.48 Mbit/s)

PC specifications used for the test	
OS	64-bit Windows 10 Pro (21H1)
Motherboard	Gigabyte B560 HD3
CPU	Core i7-11700 2.50 GHz
Chipset	Intel Rocket Lake
RAM	DDR4 3000 8 GB x 2
On-board VGA	Intel UHD Graphics 750
Monitor	9 monitors, Full HD (1920 x 1080) / 4K (3840 x 2160)