

# Max number of unique video stream configurations

Buffer limitation on some hardware platforms

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## 1. Introduction

Due to introduction of new hardware in selected models in the M-line segment, the number of different configured video streams available to a client is limited. This document provides an overview on how the different video streams are handled on these products.

The products with this hardware are: AXIS M1004-W, AXIS M1013, AXIS M1014, AXIS M1025, AXIS M1033-W, AXIS M1034-W, AXIS M1143-L, AXIS M1144-L, AXIS M3004-V, AXIS M3024-LVE, AXIS M3005-V and AXIS M3025-VE. Please check the tables below for the available video streams/resolution in different products.

	<b>M1025 M3005-V M3025-VE</b>	<b>M1004-W M1014 M1034-W M1044-L M3004-V M3024-LVE</b>	<b>M1013 M1033-W M1143-L</b>
Main source buffer Max res. 1920x1080	<i>Stream 0</i> Fixed res. 1920x1080	<i>Stream 0</i> Fixed res. 1280x800	<i>Stream 0</i> Fixed res. 800x600
2 <sup>nd</sup> source buffer Max res. 720x576	<i>Stream 3/ACAP</i> Max res. 720x576	<i>Stream 3/ACAP</i> Max res. 720x576	<i>Stream 3/ACAP</i> Max res. 720x576
3 <sup>rd</sup> source buffer Max res. 1920x1080	<i>Stream 1</i> Max res. 1920x1080	<i>Stream 1</i> Max res. 1440x900	<i>Stream 1</i> Max res. 800x600
4 <sup>th</sup> source buffer Max res. 1280x720	<i>Stream 4</i> Max res. 1280x720	<i>Stream 4</i> Max res. 1280x720	<i>Stream 4</i> Max res. 800x600

## 2. New generation of products

AXIS M1045-LW, AXIS M1065-L, AXIS M1065-LW, AXIS M3044-V, AXIS M3044-WV, AXIS M3045-V, AXIS M3045-WV, AXIS M3046-V.

	<b>M3046-V</b>	<b>M1045-LW M1065-L/-LW M3045-V/-WV</b>	<b>M3044-V/-WV</b>
Main source buffer Max res. 2688x1520	4 MP fixed 2688x1520 Fixed res. 2560x1440	Fixed res. 1920x1080	Fixed res. 1280x720
2 <sup>nd</sup> source buffer Max res. 720x576	<i>ACAP</i> 320x240 to 720x576	<i>ACAP</i> 320x240 to 720x576	<i>ACAP</i> 320x240 to 720x576
3 <sup>rd</sup> source buffer No HDMI	<i>HDMI: 1080p</i> 320x240 to 1920x1080	<i>HDMI: 1080p</i> 320x240 to 1920x1080	- 320x240 to 1280x720
4 <sup>th</sup> source buffer Max res. 1280x720	320x240 to 1280x720	320x240 to 1280x720	320x240 to 1280x720

### 3. Fish-eye 360 cameras

AXIS M3047-P, AXIS M3048-P

	<b>M3047-P</b>	<b>M3048-P</b>
Main source buffer	Max res. 2048x2048	Max res. 2880x2880
2 <sup>nd</sup> source buffer Max res. 720x720	<i>ACAP</i> 4800x480 to 720x720	<i>ACAP</i> 4800x480 to 720x720
3 <sup>rd</sup> source buffer No HDMI	<i>HDMI: 720p</i> 480x480 to 2048x2048	<i>HDMI: 720p</i> 480x480 to 2880x2880
4 <sup>th</sup> source buffer Max res. 720x720	480x480 to 720x720	480x480 to 720x720

The resolutions above are only for fisheye overview and they differ for other dewarped views. When pulling view area 1 & 2 with same resolution on M3047-P/M3048-P, this will work either using the highest resolution (1920x1440) or lower resolutions like 640x480 and 480x360.

### 4. Additional 3-4 MP cameras

AXIS M2026-LE, AXIS M3046-V 1.8 MM, AXIS M3106-L/LVE & Mk II, AXIS M4206-L/-LV

	<b>M2026-LE</b> <b>M3106-L/-LVE &amp; Mk II</b>	<b>M3046-V 1.8 MM</b>	<b>M4206-V/-LV</b>
Main source buffer	Fixed res. 2688x1520	Fixed 16:9 2304x1296 Fixed 4:3 2016x1512	Fixed res. 2048x1536
2 <sup>nd</sup> source buffer Max res. 720x576	<i>ACAP</i> 320x240 to 720x576	<i>ACAP</i> 320x240 to 720x576	<i>ACAP</i> 320x240 to 720x576
3 <sup>rd</sup> source buffer No HDMI	- 320x240 to 1920x1080	<i>HDMI: 1080p</i> 320x240 to 1920x1080	<i>HDMI: 1080p</i> 320x240 to 1920x1080
4 <sup>th</sup> source buffer Max res. 1280x960	320x240 to 1280x960	320x240 to 1280x960	320x240 to 1280x960

### 5. New additions

AXIS M3064-V, AXIS M3065-V, AXIS M3075-V, AXIS M3066-V, AXIS M3205-LVE and AXIS M3206-LVE.

	<b>M3066-V</b> <b>M3206-LVE</b>	<b>M3065-V, M3075-V</b> <b>M3205-LVE</b>	<b>M3064-V</b>
Main source buffer Max res. 2304x1728	4 MP fixed 2304x1728 3 MP fixed 2304x1296	Fixed res. 1920x1080	Fixed res. 1280x720
2 <sup>nd</sup> source buffer Max res. 720x576	<i>ACAP</i> 320x240 to 720x576	<i>ACAP</i> 320x240 to 720x576	<i>ACAP</i> 320x240 to 720x576
3 <sup>rd</sup> source buffer No HDMI	<i>HDMI: 1080p</i> 320x240 to 1920x1080	<i>HDMI: 1080p</i> 320x240 to 1920x1080	- 320x240 to 1280x720
4 <sup>th</sup> source buffer Max res. 1280x960	320x240 to 1280x960	320x240 to 1280x960	320x240 to 1280x720

Products having HDMI option will reserve the 3th source buffer for this option when it's enabled.

Stream (0) is statically configured to the system's maximum default resolution, the other streams are dynamically configured between the maximum and minimum supported resolutions by the product.

Please note also that for 1 MP products, the 3rd source buffer can provide a 1440x900 resolution (which is an up-scaled resolution) via API even if the max resolution is 1280x800 for these products.

## 6. Troubleshooting

You may refer to each product's release notes for all the supported resolutions. You will also notice the following line in the release notes for these products with hardware limitation:

*5.40.5:L35026 Number of different configured video streams are limited by hardware.*

When the maximum number of the buffers are used then you will see the "503 Service Unavailable" error message in the Live view page of the camera. In other applications like ACC this shows up as "Camera error". You will also notice some log information similar to the examples below in the camera's system log.

For example, if the camera is used with ACC, 2-3 streams will be occupied and if you request another video stream with another resolution then all buffers are full.

Here is an example with AXIS M3005-V which can't respond to a video stream request on 1024x768 resolution.

```
<INFO> Jan 4 11:22:03 axis-00408cdc12b7 /usr/bin/ambad[960]: Unable to find available stream configuration for resolution 1024x768
<INFO> Jan 4 11:22:03 axis-00408cdc12b7 /usr/bin/ambad[960]: buffer[0]: fixed 1920x1080, current 1920x1080
<INFO> Jan 4 11:22:03 axis-00408cdc12b7 /usr/bin/ambad[960]: buffer[1]: max 720x576, current 0x0
<INFO> Jan 4 11:22:03 axis-00408cdc12b7 /usr/bin/ambad[960]: buffer[2]: max 1920x1080, current 1280x960
<INFO> Jan 4 11:22:03 axis-00408cdc12b7 /usr/bin/ambad[960]: buffer[3]: max 1280x720, current 0x0
<INFO> Jan 4 11:22:03 axis-00408cdc12b7 /usr/bin/ambad[960]: Failed to allocate a source buffer
```

As you can see from the log, the reason for this is that the source buffer 0 is reserved for the max resolution (1920x1080), source buffer 1 and 3 can't provide 1024x768 resolution and the source buffer 2 is occupied with the 1280x960 resolution requested by the VMS. The solution for this case would be either requesting 1280x960 stream with the same parameters as on the VMS or changing the stream parameters in VMS to be the same on the camera 1024x768.

Here is another example with AXIS M1033-W which can't respond on a forth requested video stream with a resolution on 800x600.

```
<INFO> Dec 30 21:15:36 axis408 /usr/bin/ambad[1051]: buffer[0]: fixed 800x600, current 800x600
<INFO> Dec 30 21:15:36 axis408 /usr/bin/ambad[1051]: buffer[1]: max 720x576, current 0x0
<INFO> Dec 30 21:15:36 axis408 /usr/bin/ambad[1051]: buffer[2]: max 800x600, current 800x600
<INFO> Dec 30 21:15:36 axis408 /usr/bin/ambad[1051]: buffer[3]: max 800x600, current 800x600
<INFO> Dec 30 21:15:36 axis408 /usr/bin/ambad[1051]: Failed to allocate a source buffer
```

The reason for the case above is that the user has already configured 3 video streams with 800x600 resolution using different frame rate (one for continuous recording on SD-card, one for uploading images to FTP server and the third one for uploading images using SMTP). The solution for this case is that the user may configure FTP/SMTP events with the same stream configuration and also possibly change the stream settings for the continuous recording to the default (same as for live view).

Here is an example with the new generation of products (AXIS M3045-V) which can't respond on a fourth requested video stream with a resolution on 1280x720.

```
[ INFO ] /usr/bin/ambad[1035]: Failed to allocate a source buffer (1280x720, channel 1): No matching buffer available
[ INFO ] /usr/bin/ambad[1035]: stream[1]: encoding [ 1920x1080, 25/1 fps, buffer_id 2, state active, channel 1 ]
[ INFO ] /usr/bin/ambad[1035]: stream[2]: encoding [ 640x480, 25/1 fps, buffer_id 3, state active, channel 1 ]
[ INFO ] /usr/bin/ambad[1035]: stream[3]: encoding [ 320x240, 25/1 fps, buffer_id 1, state active, channel 1 ]
[ WARNING ] monolith: Failed to allocate 1280x720 H264 stream on channel 1: Failed to allocate stream resources: Failed to add stream
[ ERR ] monolith[925]: Could not set caching pipeline to playing.
```

Products mentioned above can have max 4 different video buffers to configure for different video streams. If the product is supporting ACAP (for example AXIS M3004-V/M3005-V) then one buffer is reserved for ACAP (AXIS Camera Application Platform) and three fixed video buffers will be available. Changing any parameter like resolution, frame rate, rotation, compression, video codec etc., will be counted as a different stream and will occupy one buffer.

However, if multiple clients request the same video stream (without specifying any parameters), then all clients will get video from the same buffer which means that in this case just one buffer will be used.

Currently, a video stream can be configured in two ways. The most common method is to specify the parameters as part of the video stream request (for example, resolution=1280x720&videocodec=h264). The other method is to create a stream profile defining the parameters and then specify the stream profile in the video stream request. The allocation of buffers are done on a first-come, first-served basis which may cause problems for some applications that rely on the possibility to always being able to get a stream with a specific configuration.

## 7. Recommended setup

To minimize the complexity and setup for an application user, it is recommended to limit the number of available streams to two (typically one for live viewing and one for recording) and to make sure that no other system components are accessing the camera. Here, "system components" also includes camera events that require a video stream.

When using Axis Companion, a workaround is to change the stream profile for AC Motion to the same profile as AC Continuous Recording and try again. You should also be careful about configuring other events and watching Live view streaming in different resolutions at the same time. Similar care should be taken with ACS as well, especially in multi-client scenarios. In those cases, it will make it easier for the camera side if you make sure all split views in all ACS clients are using the same video settings. It will be even better if you make sure that the ACS recording settings have the same settings as well.



# About Axis Communications

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Axis has more than 2,500 dedicated employees in more than 50 countries around the world, supported by a global network of over 80,000 partners. Founded in 1984, Axis is a Sweden-based company listed on NASDAQ Stockholm under the ticker AXIS.

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