White paper

Controlled full frame rate

January 2018

AXIS COMMUNICATIONS

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1. Introduction

A surveillance camera is sometimes required to accurately capture small details and securely capture fast movements at the same time. To do this, the camera must maintain the full frame rate. It is possible to configure an Axis camera to deliver a set number of frames per second (fps), for example full frame rate at 25 or 30 fps, without compromising the image quality. However, the specified frame rate can never be 100% guaranteed, especially when trying to maintain it throughout the system all the way to the recorder or security center.

This document provides a background on controlled frame rate, and provides a list of considerations to make in order to help the camera deliver its full frame rate.

2. When do you need controlled full frame rate?

Typical scenarios where controlled full frame rate (25 or 30 fps) could be desired include places where cash is handled, for example bank offices or exchange offices, where a high image quality would make it possible to verify the denomination of bank notes, or casinos to verify the suit and rank of playing cards. A surveillance camera that never misses a frame enables strict control of cash flows.

3. How do you achieve controlled full frame rate?

It is possible to configure an Axis network camera to deliver a set number of fps, such as 25 or 30 depending on the power frequency , while still maintaining a high image quality. However, in order to fully make use of that 30-fps frame rate, it has to be preserved all the way from the camera, through routers, network connections, and servers, to the video management system (VMS), as illustrated in Figure 1.

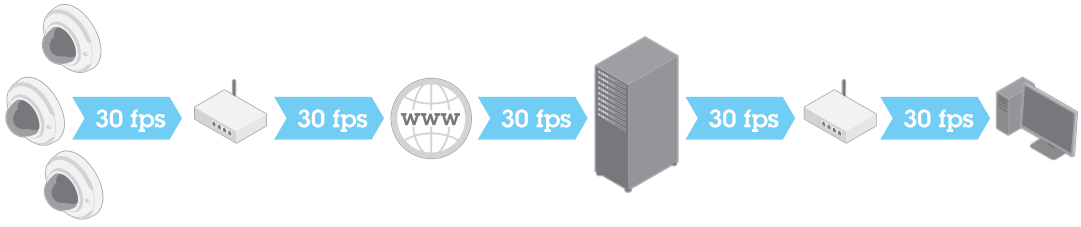

Figure 1: A surveillance system with a 30-fps controlled frame rate in every step. The frame rate of the camera can be preserved throughout the system only if the overall system performance is sufficient.

The network system must have sufficient server capacity to manage the amount of video created. Storage, network traffic, routers, and servers must also be fast enough to process all the incoming data, since a system is never faster than its slowest component or device.

Details on how to preserve the frame rate throughout the whole system is beyond the scope of this paper. Regarding the camera, however, some aspects should be considered. In short, the camera should use its default maximum shutter speed (1/30 of a second), and also be set to prioritize video streaming over other camera features, as detailed in the next section.

4. How do you make the camera deliver full frame rate?

Axis cameras normally deliver full frame rate. However, there is also a trade-off between performance (frame rate and image quality) and the use of features, such as distortion correction, analytics and event handling, or audio. When using features that require a lot of processor power, a camera could thus lose an occasional frame, especially under challenging circumstances such as at a large, sudden change in light levels.

Consider the following aspects for the camera to prioritize full frame rate:

> Try to maintain favorable and uniform lighting in the scene
> If you need to change any camera settings, do so via the VMS, if possible. If you make settings locally in the camera, there is a risk that the VMS overrides them
> Use the default maximum shutter speed (1/30 of a second) and default capture mode (25 or 30 fps)
> Use external storage. An SD card in the camera may not store data fast enough. It is still possible to keep an SD card in the camera for use in the event of network failure, in which case frames might be dropped but video can still be recorded.
> Use H.264 or H.265 video compression. Motion JPEG might deliver a lower frame rate.
> Use Zipstream, which decreases the bandwidth requirements for storage and network traffic.
> Use WDR if needed. It should not affect the frame rate.
> Do not use ACAPs, audio, or any other applications
> Do not enable electronic image stabilization (EIS) or barrel distortion correction (BDC). They are off by default

For practical details on how to make the suggested settings, see the manual of the camera or VMS. Remember that settings are generally not locked, but may be automatically altered by the VMS, for example in connection with software upgrades.

5. Why can full frame rate never be 100% guaranteed?

The use of different features and settings may affect the camera's performance, possibly resulting in a decreased frame rate or lower image quality. For the frame rate to be preserved through the whole network system, the server capacity must also be sufficient to manage the amount of video created, and storage, network traffic, and routers must be fast enough to process all the incoming data.

71516/EN/R1/1801

About Axis Communications

Axis offers intelligent security solutions that enable a smarter, safer world. As the global market leader in network video, Axis is driving the industry by continually launching innovative network products based on an open platform - delivering high value to its customers and carried through a global partner network. Axis has long-term relationships with partners and provides them with knowledge and ground-breaking network products in existing and new markets.

Axis has more than 2,700 dedicated employees in more than 40 countries around the world, supported by a network of over 90,000 partners across 179 countries. Founded in 1984, Axis is a Sweden-based company listed on NASDAQ OMX Stockholm under the ticker AXIS.

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