Smart Stream
Better Video Quality with Lower Bandwidth

VIVOTEK's Smart Stream is a state-of-the-art video encoder enhancement that is fully compatible with both H.264 and H.265 standards. Through a collection of algorithms that analyze the video stream in real time, details of regions of interest and specific movements are prioritized and preserved with fine-tuned video settings. Optimizing video surveillance, VIVOTEK Smart Stream can significantly lower bandwidth and storage requirements without sacrificing visual quality. In some cases, it can reduce storage usage by up to 80%. As a world leader in video compression, VIVOTEK constantly innovates new technologies to render encoding more efficient and provide and ever smarter Smart Stream.

Region of Interest

Advanced algorithms detect motion and automatically enhance video quality for these moving objects or persons. Other regions are rendered with a relatively lower visual quality, which reduces overall video bitrate. The system can also be configured to use a combination of both ROI and automatic movement detection. For example, in a traffic monitoring application, only the road and the vehicles on it need to be captured at high resolution, but surrounding buildings are of no interest, so a lower baseline video quality for those areas is adequate.

Without Smart Stream   **Smart Stream - Auto Mode**
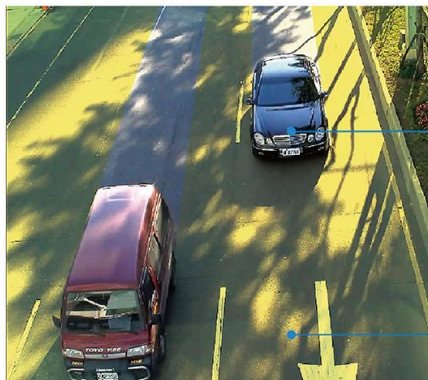
Moving Object with Higher Quality

Background with Baseline Quality

In this scenario, Smart Stream auto mode saves 30% of the original bandwidth required, while the detail of moving objects is kept.

Dynamic Intra-Frame Period

I-frames consume the most bitrate within the encoded video stream. Therefore, the longer the I-frame interval, the lower the overall bandwidth of the video will be. However, a longer I-frame interval will also introduce more encoding propagation errors and side effects for the recording application. By analyzing the scene, Dynamic Intra-Frame Period can optimize the I-frame interval to reduce bit rate without compromising video quality. In doing so, Dynamic Intra Frame Period allows for a maximum reduction of bandwidth, while preserving the highest video quality for objects of interest.

Dynamic Intra Frame Period Disabled   **Dynamic Intra Frame Period Enabled**

Smart Q

Smart Q reduces bitrate by using real-time scene information. The scene complexity is analyzed and can be dynamically separated into several blocks. Each block is encoded with an optimized compression parameter to maintain visual quality and reduce bitrate.



Analytic Scenes of Smart Q

Smart Stream Evolution

VIVOTEK unceasingly enhances Smart Stream by adding different features, including ROI, Dynamic Intra Frame Interval, Smart Q and smart FPS. The Smart Stream features table below indicates including features included in each generation.

Smart Stream Features Table

Features	ROI	Dynamic Intra Frame Period	Smart Q	Smart FPS
Smart Stream	V			
Smart Stream II	V	V		
Smart Stream III	V	V	V	V

Finally, the below bandwidth comparison table displays network bandwidth reductions when smart stream generation is applied on the same original video stream.
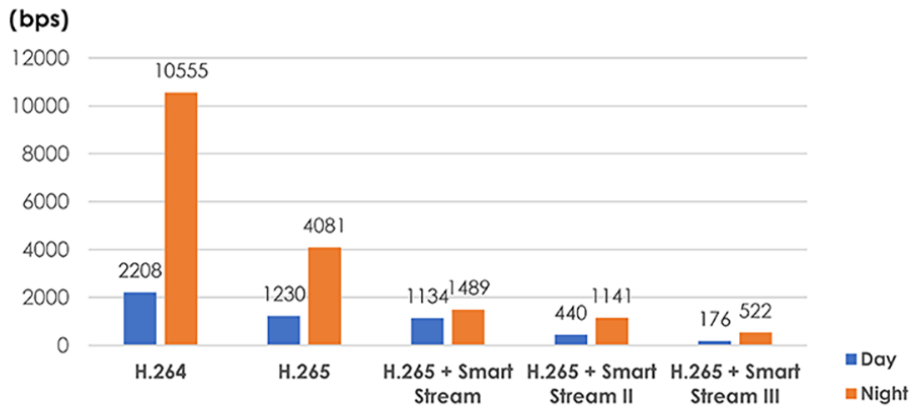
Bandwidth measurement using different Smart Stream generation