

Dual Streaming – The best way to go? Transmission technologies saving bandwidth

These days, the amounts of data created with the recording of surveillance scenarios are huge. Particularly the demand for continuously improving image quality as well as the trend towards megapixel and HD cameras are contributing to an ever increasing amount of image data. As a result, the demand for storage space is growing but also the required bandwidth for the transmission of the images. Simple streaming methods are mostly no longer sufficient as they put too high a strain on the network. The question is how many transmission methods are there and what benefits do they offer.



Using streaming methods it is possible to transmit data via a network. The transmission of live pictures and recorded images is carried out with the same quality as the recording. The downside of that is the requirement for a large bandwidth in order to be able to transmit the high-resolution image data.

A practical example: The images of a camera are recorded with highest quality at 25fps directly at the recorder. Let's assume the data rate for the recording is 2Mbit. If the security operator wants to see the images, the stream will be transmitted at 2Mbit. The network load becomes even bigger when not just one camera but, for instance, four cameras must be transmitted in a four-times split display. In that case the required bandwidth would quickly have amounted to 8Mbit. If another operator also wants to view the images on his workstation, the same amount of data has to be transmitted again

Even with a broadband network the limits of what is possible are quickly reached with a large number of viewers and/or various transmitted cameras. So as to reduce the network load, different optimised methods of image transmission are available.

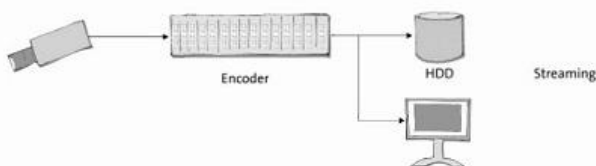
Dual Streaming

As the designation indicates there are two streams transmitted when Dual Streaming is used.

In technical literature the term Dual Streaming is mostly used to describe two different approaches. For one thing it is used to characterise simultaneous transmission of the image data in different formats (e.g. one stream transmits JPEG, the other MPEG-4). Secondly, it is also used to describe the splitting of the streams in recording and transmission. In the following the latter definition shall serve as the basis for further considerations.

With Dual Streaming the encoder thus produces two streams, one of which is used for the recording, the other for the transmission. Thereby, a different quality can be selected for the transmission of live images than that used for the recording.

This means the images can be recorded in high quality at the recorder. For the transmission of the images, however, a lower resolution is chosen in order to reduce the network load – or vice versa!

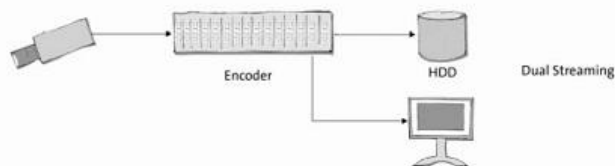


Dual Streaming – The best way to go? Transmission technologies saving bandwidth

A typical application area: The security operator sees the live images on his monitor in the optimal quality for transmission. This allows him to keep an overview of the current situation at any point in time. The recording at the recorder is carried out with highest resolution though, which means that all essential details are recognisable in case of an incident. This ensures that no information is lost during the recording process and thus guarantees that images can be used as evidence in court. At the same time, however, the network load during the transmission of the images is minimised.

The bit and frame rate can be set individually for every camera, which means that the operator has the possibility to specifically adjust the parameters to his requirements and possibilities.

Referring to the above-mentioned example: The security operator is able to continue recording the image with 2 Mbit. However, the transmission for example only requires 500 Kbit. With a four times split the required bandwidth consequently reduces to 2 Mbit, compared to the 8 Mbit that would be required without dual stream.



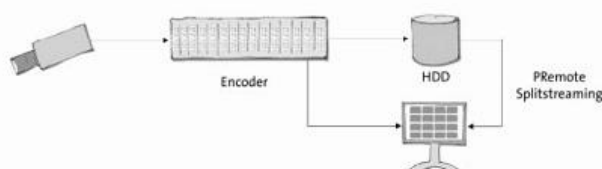
PRemote

For the user Dual Streaming is an effective and easy-to-use method for transmitting live images with low network load. However, Dual Streaming has its limitations, too; for example when there is only one ISDN connection available or when the simultaneous transmission of both, live and recorded images is required.

The Regensburg based specialist CCTV/IP manufacturer Dallmeier has therefore developed another method of transmission: PRemote.

PRemote, just like Dual Streaming, also enables the transmission of images with low bit rates, but offers further advantages beyond that:

- Recorded image material can also be transmitted with low bandwidth
- PRemote generally requires less bandwidth than Dual Stream
- Split Streaming with up to 16 times split view is possible
- Real-time transmission with 25fps at 4CIF possible (with Dual Streaming only one CIF possible in most cases due to the limited resources)



Transmission of recorded image material

While Dual Streaming merely allows for the quality of the live images to be changed, PRemote also enables a low-bandwidth transmission of recorded image material. Hence, not only can live images be viewed over great distances; it is also possible to evaluate recorded image material from remote locations. The evaluation is carried out with the accustomed user-friendliness, which means that it is also possible to fast-forward and to rewind. Additionally, searches are conducted at a very high speed. Using intelligent search functions such as the SmartFinder relevant data are quickly found. Subsequently, a backup of the data can be transmitted in high quality.

Reduced network load

PRemote generally consumes less bandwidth than Dual Streaming while providing the same image quality, as Dallmeier has optimised the specific codec for low bandwidths. Therefore, PRemote is particularly suitable for networks with narrow bandwidths as used in mobile applications in connection with PDAs, UMTS, EDGE, GPRS, VPN network connections between various locations, or DSL connections with 128 Kbit upload. Even when there are higher bandwidths available the compression achieved with Dual Stream is not sufficient.

Dual Streaming – The best way to go? Transmission technologies saving bandwidth

For it is frequently forgotten that, apart from the download, the upload is also critical for the image transmission. Even with high-performance DSL connections the upstream is significantly lower than the downstream, which means that in fact the data upload is where the bottleneck occurs and not the download. PRemote is thus not only ideal when the viewer is restricted by a narrow bandwidth but also when the upstream at the recorder is too low.

Split Streaming possible

Dual Streaming is camera related i.e. an active connection can only be established with one camera at a time and thus the user just receives a single image. PRemote, by contrast, allows for a multi-split, namely of up to 16 times. Thereby, the multi-split is transmitted in one single image and so only one stream is necessary! Switching from the split to a single picture can conveniently and quickly be made by a double-click. Let us return to the exemplary calculation used before. With PRemote the size of the image to be transmitted reduces once more, for example down to 128 Kbit. Since the multi-split is furthermore transmitted in one single image only one stream is required. This means that even with a 16 times split the necessary bandwidth is only 128 Kbit.

Technical background

PRemote is available for the Dallmeier Wavelet and H.264 recorders, whereby PRemote respectively transcodes the image material into the format that is best suited for the transmission.

As is usual PRemote is easy to control via the PView interface. The user simply uses four buttons to set the available bandwidth (PSDN, ISDN, ISDN 2 channels, LAN, 0= user-defined) without the need for broad technical knowledge or long-winded configurations.

No more trade-offs

What used to be standard with analogue systems is often waived in digital solutions out of necessity, namely a judder-free display of the image material. This is because the available bandwidth is insufficient for the transmission of the images. Viewers really should not have to put up with this shortcoming.

Even with a low bandwidth a judder-free display is possible by using PRemote. A low delay i.e. a prompt transmission of the images is also critical for the control of PTZ cameras (Pan/Tilt/Zoom) in order to enable a precise control of the cameras.

Optimal transmission for any application

Whether it's single streaming, Dual Streaming or PRemote, the customer has the choice. What the best solution for the customer is depends on the individual situation and specific requirements.

The development of PRemote is another example of the innovative strength and customer orientation of the Regensburg based company. For with PRemote Dallmeier, in addition to the available transmission methods, offers its customers an innovative streaming method optimised for low bandwidths.