


# TIME MATTERS - THE VALUE OF LOW LATENCY



Different periods of time are critical to different subject areas. From astrophysicists analysing the evolution of the universe over 4.5 billion years ago, through archaeologists studying the dawn of early man nearly 300,000 years past, to television engineers who focus on the implication of events that occur in the blink of an eye down to millisecond resolution. In video, time matters.

## HCAM & ULTRARECEIVER LD

In bringing a televised event to a consumer, video content passes through many processing stages and within each stage the processing takes time to complete. There can often be latencies of up to 0.5 seconds getting content out of a major outside broadcast back into the studio and frequently additional delays of over 3 seconds in delivering that content to home consumer linear broadcast TV platforms. These latencies can be critical – a major event such as an Olympic 100m final could be nearly over in the stadium before a viewer has seen the start! The situation is considerably worse for many live streamed services which can suffer over 1-minute time lag compared to traditional broadcast platforms. Indeed, because viewers naturally gravitate towards platforms that show the content first, some operators choose to trade-off video quality in favour of latency reductions to win the ratings battle.

As video production shifts towards greater video quality – taking up advances such as 4k UHD or as operators seek to implement greater bandwidth efficiency savings in their transmission chains – either to reduce costs or offset the bandwidth requirements of 4k. Because of this, there is an ever-increasing uptake of HEVC compression technology. More efficient and more processing intensive codecs such as HEVC have the potential to increase undesirable latencies. The greater pixel count that comes from higher resolution images has the potential to increase the processing time still further.

Image acquisition from camera through the production chain also incurs some delay as the video frames are aligned and processed. But what are the latency implications if the cameras capturing the event are wireless?

Wireless cameras employ video compression and sophisticated RF modulation techniques in order to achieve reliable, long range transmission over narrow frequency bands. Because of the greater complexity of HEVC algorithms and the increased processing load from 4k images, UHD capable wireless camera transmission systems have delivered end-to-end latencies that have, for some, proven undesirable.



In producing a live event, the director will cut between camera views to follow the action and to create a sense of drama. Event productions often contain a mix of fixed location wired cameras and wireless cameras which offer the flexibility to roam the event and offer dramatic viewing angles. The wired cameras will deliver very low latency imaging whereas the wireless cameras (UHD systems especially) could offer longer latencies. The time offset between the wired and wireless cameras delivering their imagery has the potential to create production problems - leading to a risk that the viewer will see the action repeated during a camera cut or even missed entirely. Neither are desirable.

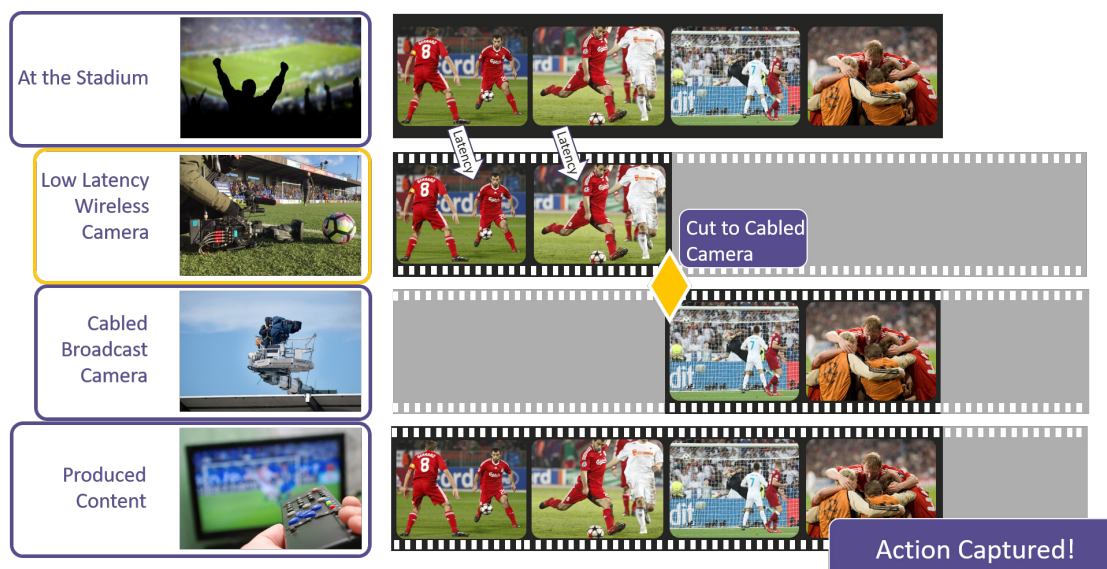
## THE CHALLENGE OF LONG LATENCY



Newer, more sophisticated HEVC UHD capable wireless camera systems have recently been developed that significantly reduce processing latencies. By improving the video decode implementation through optimized buffer management and implementing greater parallel processing by pipelining the data flows, end-to-end latencies as low as a single video frame can be achieved.

Use of lower latency wireless camera systems can revolutionize event production—allowing the director to freely cut between wired and wireless cameras - at will, without fear of any undesirable mismatches in video presentation.

## THE BENEFIT OF LOW LATENCY



The IMT Vislink HCAM and UltraReceiver LD end-to-end UHD wireless camera system provides premium quality 4k video quality in conjunction with High Dynamic Range. By utilising bandwidth efficient LMS-T modulation as well as DVB-T capability, the solution provides highly mobile, reliable, bandwidth efficient wireless transmission - at range. The end-to-end system offers single-frame latencies.

## GET IN TOUCH

For more information on any of the products in the IMT Vislink portfolio please contact: [sales@vislink.com](mailto:sales@vislink.com)

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