

Monitoring your video production is always a challenge when you need multiple eyes on the shot to get it right, and there are a lot of eyes.

However, with a wireless video transmission revolution fully underway, it can be difficult to wade through all the options for what you need—especially regarding price.

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Most wireless transmission systems on the market right now support up to 1080p60 (**1080p60** is the same resolution + 60 frames per second **1080p60** means 1920 x 1080 pixel, at 60 frames per second, in progressive scan order) input and transmission, and many support HDR workflows, which will suit your visual needs and the requirements of most portable monitors. The Mars 400 transmitter features HDMI input up to 1080p60, and the receiver has two HDMI outputs for monitors, computers, or switches.

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The 400S transmitter expands on the 400 with SDI and HDMI inputs that support up to 1080p24 and features both SDI and HDMI outputs on the receiver, providing compatibility with more cameras and receiving endpoints.

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Comparing Different Tech

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Wireless Broadcast Transmission Technologies

There are three leading wireless broadcast link technologies – each based on a different transmission method:

- OFDM / COFDM solutions
- Cellular network solutions
- Video over WiFi solutions

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OFDM Technology

In [telecommunications](#), **orthogonal frequency-division multiplexing (OFDM)** is a type of [digital transmission](#) and a method of encoding digital data on multiple [carrier](#) frequencies. OFDM has developed into a popular scheme for [wideband digital communication](#), used in applications such as digital television and audio broadcasting. The transmitter is positioned on the camera; the receiver is located inside the OB-van or at the event's media center where the content is gathered and transmitted forward.

The [cyclic prefix](#), which is transmitted during the guard interval, consists of the end of the OFDM symbol copied into the guard interval, and the guard interval is transmitted followed by the OFDM symbol. The reason that the guard interval consists of a copy of the end of the OFDM symbol is so that the receiver will integrate over an integer number of sinusoid cycles for each of the multipaths when it performs OFDM demodulation with the FFT(Fast Fourier Transform).

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A simple example as we see in figure: If one sends a million symbols per second using conventional single-carrier modulation over a wireless channel, then the duration of each symbol would be one microsecond or less. This imposes severe constraints on synchronization and necessitates the removal of multipath interference. If the same million symbols per second are spread among one thousand sub-channels, the duration of each symbol can be longer by a factor of a thousand (i.e., one millisecond) for orthogonality with approximately the same bandwidth. Assume that a guard interval of 1/8 of the symbol length is inserted between each symbol. Intersymbol interference can be avoided if the multipath time-spreading (the time between the reception of the first and the last echo) is shorter than the guard interval (i.e., 125 microseconds). This corresponds to a maximum difference of 37.5 kilometers between the lengths of the paths.

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Video Links over Cellular Networks

In wireless video links over cellular networks, the transmitter is positioned on the camera or in a backpack carried by the cameraman, transmitting the content over the cellular network and from there to the broadcaster's servers. The receiver is usually a software on the server. Cellular systems often encounter congestion. In crowded events with many phone users, 3G & 4G networks may not provide the bandwidth required to maintain good image quality. Another typical problem is the high latency (up to 3 seconds) of the system.

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Video Links over WiFi

In video over WiFi systems. The transmitter is located on the camera and the receiver is either near the WiFi access point in the same location or at the TV station beyond the internet cloud. The main advantage of WiFi video link solutions is their low cost, making them a perfect choice for low-budget productions. The disadvantages are comprised picture quality and stability, crowded frequencies and the fact that they share resources with other applications and users.

Combining two solutions can overcome some of these inherent technological limitations. For example when employing OFDM in a congested cellular environment, the OFDM link can be used to “jump” the first few hundred meters away from the cellular congestion.

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Wifibroadcast – Analog-like transmission of live video data

Wifibroadcast is a project aimed at the live transmission of HD video (and other) data using wifi radios. One prominent use case is to transmit camera images for a first person view (FPV) of remote controlled aircrafts.

In contrast to a normal wifi connection wifibroadcast tries to mimic the advantageous properties of an analog link (like graceful signal degradation, unidirectional data flow, no association between devices).

Wifibroadcast puts the wifi cards into monitor mode. This mode allows to send and receive arbitrary packets without association. Additionally, it is also possible to receive erroneous frames (where the checksum does not match). This way a true unidirectional connection is established which mimics the advantageous properties of an analog link.

A few of them are:

- The transmitter sends its data regardless of any associated receivers. Thus there is no risk of sudden video stall due to the loss of association
- The receiver receives video as long as it is in range of the transmitter. If it gets slowly out of range the video quality degrades but does not stall. Even if frames are erroneous they will be displayed instead of being rejected.