

Application Note

Product: Video Baluns
Subject: Cat5e and Cat6 Cable
Date: July 9, 2007

This application note covers several key points when using Cat5e/6 cable in the analog video environment:

1. Cat5e and Cat6 grade twisted pair has replaced standard Cat5 cable in most networking and audio-video installations and is now commonly deployed in analog audio-video such as CCTV, digital signage, boardroom projection systems and home theatre systems.
2. The main improvement in Cat5e and Cat6 cable is the ability to support higher data rates and therefore higher bandwidths. For example, Cat6 and Cat6A supports 1G and 10G Ethernet respectively.
3. One of the key factors to consider when installing component analog video (RGB or RGBHV) over twisted pair is "skew". Skew is due to the different twist rates between twisted pairs under the same 4-pair cable jacket. Skew specifies the maximum time delay that will result between the first arrival of the signal and the fourth (and latest) arrival and is generally specified in terms of nanosecond per 100m. Skew is typically manifested by bright vertical lines or a delayed second image to the right of high contrast objects or text characters. Skew tends to be more noticeable with high contrast static images and less noticeable with full-motion video.
4. In order to minimize the effect of skew, the following solutions are recommended;
 - a. Use a "low-skew" twisted pair cable where the twist rates on each wire pair is the approximately equal. For example Belden offers a "nano-skew" cable (7987R/7987P) designed for video applications.
 - b. Insert a skew compensation device at the receiver. Skew compensation allows a time delay to added to each twisted pair in order to allow all video components to arrive at the receiver simultaneously. Skew adjustment may also be found on higher-end RGB or VGA UTP receivers.
5. In terms of wire gage, Cat5 and Cat5e are specified by the EIA568 standard to have a wire gage of 24AWG. Cat6 cable may have a wire gage between 24AWG and 22AWG.
6. In regard to composite video, MuxLab has not found a significant distance improvement when using Cat5e or Cat6 cable versus Cat5. However, if the Cat6 cable is 22AWG or 23AWG, there will be less signal attenuation due to the increased cross-sectional area of the wire conductors.
7. In regard to broadband (RF) video, MuxLab estimates that Cat5e/6 yields 15% to 20% superior distance performance at channel frequencies above 550 MHz.
8. In regard to MuxLab's passive VGA Balun, (500010/11/14/40/41/42), MuxLab has found that "skew" is more visible when using Cat6 cable versus Cat5 or Cat5e cable.

For more information, please contact MuxLab Technical Support at (+1) 514-905-0588, ext 358.