

How To Secure The Best Image Quality From Any Video Conferencing System

Five ways even the best technology can fail to deliver clear communications – and what to do about it

Video conferencing has become an essential technology for many organizations.

A good video connection can closely simulate a face-to-face conversation, providing the facial and body language cues that are crucial to sensitive communications. Organizations who use video conferencing regularly find their workgroups are more productive and their decision-making faster and more reliable.

That being said, many users wish the quality of their video calls was higher. Common complaints include an inability to see people clearly at far-end sites, an inability to establish eye contact and, for many, trouble focusing on the business at hand because they are self-conscious about how they look on video.

The move to high definition technology has helped, but even those using full 1080p connections have found that, with a mediocre room setup, communications are only poor to fair.

There are at least five questions about the video conferencing room that owners must answer to get the best results from the systems they buy.

- How can we recognize and avoid setup problems that lead to image degradation, including silhouetting, poor color and lack of sharpness?
- Can we provide a more professional room environment that minimizes distractions?
- How do we ensure that image quality is high enough to read facial expressions?
- Can we help users feel more confident about their appearance on video?
- How can we improve eye contact and with it the emotional factors that affect team dynamics?

This paper will provide answers by looking at how movement, clutter and color can affect video quality; how lighting affects color and the ability to see facial expressions; how windows can affect color and the camera's iris; methods of providing clear identification of meeting participants; and factors affecting visibility and eye contact.



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1. The physical environment: How movement, clutter and color can affect video quality

The most common problem in corporate and home office video setups is clutter. Not only is it unprofessional to show a credenza stacked with coffee cups and paperwork, but shiny objects can throw off a camera's iris, darkening the faces of people in the shot.

Movement in the background can cause more serious problems. The compression algorithms used in HD video conferencing systems work by capturing repetitive information and transmitting it just once. If the area behind the people on camera is always exactly the same, then the system can capture it, reuse it as it redraws each frame, and focus its processing power on the image of the people.

If the image area includes a clock with a moving pendulum or a doorway opening into a busy work area, the system will have to capture, compress and transmit that changing background for every frame. The quality of the entire image will deteriorate.

Background color can be an issue as well, affecting how people perceive each other and, in extreme cases, the camera's white balance. System manufacturers and most design consultants recommend painting the room a light to medium gray, beige or brown.

In a perfect world organizations would dedicate a room strictly to video conferencing and carefully control any factor that might affect the image. Most, however, must use their conference rooms, classrooms and offices for multiple purposes.

Solutions

One approach to creating a simple, static, neutral background in a multipurpose room is to paint walls a beige or gray, avoid bookshelves and artwork, close doors and keep office and conference areas scrupulously clean.

Another is to put a temporary, neutral fabric backdrop behind meeting participants hiding any clutter or movement, thereby creating a dedicated video environment on a temporary basis. That approach can be easier, especially in home or executive offices where people want to decorate without worrying how souvenirs and artwork will look on video.

That solution seems obvious, but until recently there have been few, if any, commercially-produced backgrounds designed for this purpose.

Draper, Inc., has addressed the problem with a line of plain and custom-printed backgrounds that can be set up and taken down very quickly. Draper motorized backgrounds are available in single or dual-fabric wall and ceiling mounts, with the dual-fabric versions giving users a choice of backgrounds for different purposes.

For example, an executive office might be equipped with a ceiling-mounted motorized background with neutral Tundra and chroma-key green fabrics. Push one button and the office is ready for a video conference; push another and it becomes a temporary production studio. With the chroma key background, the CEO can appear to be in front of headquarters, at a client site, or perhaps in front of a cityscape while addressing the company in a video.

For a smaller office, cubicle or at home, Draper offers a bottom-up portable mechanism, the VCB Traveller, outfitted with a neutral or printed background. A user can place it on the floor behind his or her chair, pull up the fabric and lock it into place. One caution is to measure the pickup area of the camera or webcam carefully. Many Draper customers use an 84" wide background at home.

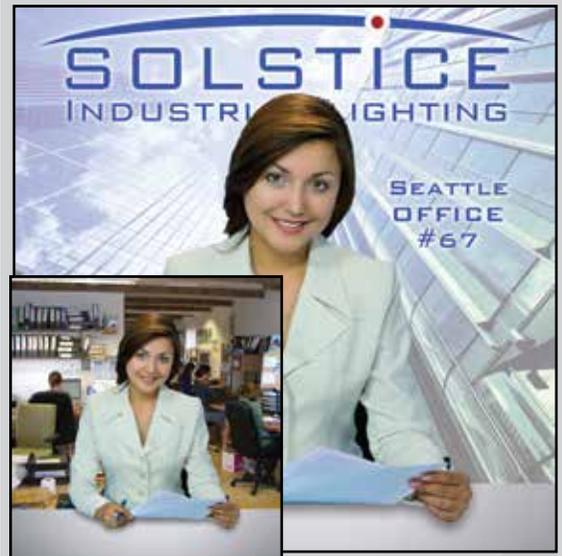
2. Lighting: The key to good color and clear facial expressions

The color and direction of room lights are also crucial to the quality of the images shot for a video conference. You want bright, soft lighting that illuminates people evenly and allows the camera to pick up gestures and facial expressions.

Most rooms used for video conferences are equipped with fluorescent ceiling fixtures set up according to guidelines meant for office installations. The brightness levels are good, but since standard fixtures throw most of their light straight down, there will be shadows in peoples' eye sockets and below their noses and chins. Meeting participants with prominent features will not look good, and it may be difficult to see their eyes and read their expressions.

Color conflicts are common in multipurpose rooms, especially if the lighting designer mixes fluorescent with LED, incandescent or metal halide recessed or accent lighting. Each of these types of lamp produces a different color temperature. The eye and the brain will compensate for these differences, but the camera cannot. The image shown on the far-end display can be quite unattractive, often with a pink or greenish tint or both pink and green in the same shot.

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Solutions

Fortunately, there are several options on the market that can help.

Some lighting designers add wall-mounted fixtures at the front of the room to fill in the shadows on faces.

Brightline and Lutron offer specialized fluorescent fixtures that create an effect similar to studio lights. Set into the ceiling like standard fluorescents, they throw their light at about a 45° angle, evenly illuminating each face without harsh shadows. This can be a very good solution for multipurpose rooms, since the lighting produced works well for non-video meetings and office work.

Brightline offers portable video lights suitable for a home office as well. These LED light bars mount to a computer monitor above a webcam, providing soft, even lighting for one or two people.

In a conference room or office with mixed lighting, it's important that users turn off accent lights before the video conference begins—or that the system integrator programs the lighting controls so that only a single type of fixture stays on when the conferencing system is in use.

Windows, too, can be a source of color conflicts, introducing daylight at 6500° K (or higher) into a room illuminated mainly with fluorescents (about 3000° if equipped with soft-white bulbs).

3. Windows: controlling color and hot spots

The problems windows create can be serious. A bright window directly behind a meeting participant will cause the camera iris to open, darkening everything in the foreground to a silhouette.

A window to the side may cause hot spots on one side of peoples' faces or on the background, depending on the direction of the sun and the time of day. Hot spots will also throw off the camera's iris and darken or silhouette other areas of the shot.

Indirect sunlight will not cause such severe problems, but it will light areas close to the windows more than areas farther away, and the light will be a different color than artificial lights.

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If the daylight is very soft and even, the camera may compensate, but generally you'll see a color shift with people closer to the windows taking on a different tint than those farther away. (If the room is lit with fluorescents, faces and backgrounds near the windows will take on a cyan cast. With other types of lights, the color may shift in different ways).

Solutions

The cure for problems caused by windows is to shade those windows.

If the sunlight is indirect, lightweight or even mesh shades or drapes can do the job. If the sun shines directly into windows, then blackout shades may be necessary. These types of shades eliminate all of the light entering the room, particularly hot spots caused by gaps between the shades and the window frames.

While manual systems can certainly work, most video conferencing room designers recommend motorized shades, such as those built by Draper, to ensure that windows are darkened for every video call.

4. Signage: Clear identification of meeting participants

In a multi-point call, it can be very confusing to figure out who is who and where they are located.

This is especially true in rooms used for presentations to clients, but it can be an issue even for working teams where the team members have not met each other face to face or who meet infrequently. The problem is exacerbated by human nature: most people do not like to admit if they have forgotten someone's name, yet misidentification can cause major problems in collaborative work.

Solutions

The traditional solution to identification problems is to print a placard with each meeting participant's name and location that rests on the table or desk in front of them.

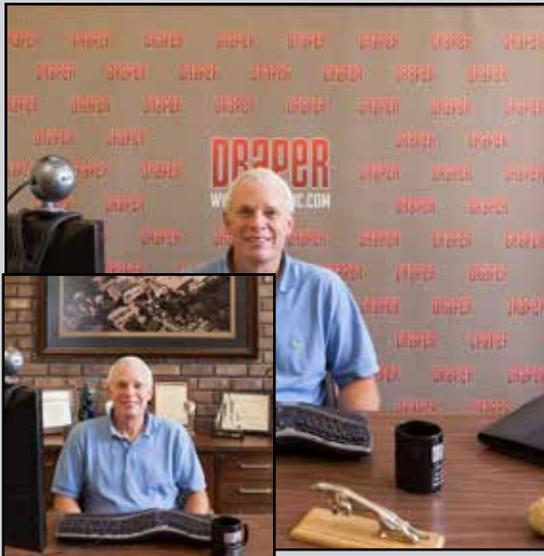
That can work well in many situations, but if the system puts multiple locations on one screen at once, or if some people are connecting from laptops or tablets, the type on those placards can get pretty small.

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At Draper, managers and staff use printed backgrounds for any multi-point video conference. Each incorporates a company logo and office location, much like the backgrounds sports teams use for TV press conferences.

It's a simple solution that eliminates confusion and enhances the professional image of the company's personnel.

5. Camera position: Visibility and team dynamics

One of the potential drawbacks of a video call is the feeling that people can't achieve a close connection with the people they are meeting with. The camera position can have a lot to do with this problem and its solution.

In the worst cases, meeting participants are just not able to see everyone at the far-end location. If a room is equipped with a traditional straight or boat-shaped conference table, for example, some people will be positioned directly behind others from the point of view of the camera.

There's a more subtle issue as well. People want to feel that others are looking directly at them, that they are paying attention to what they're saying. Yet in surveys, respondents who use video frequently will report that people on the far end can appear to be avoiding eye contact.

Of course, nearly everyone in a video conference will look directly at their counterparts' image, but because the camera cannot be positioned in the center of a screen, they seem to be looking away.

Solutions

The best possible camera position depends on the room. If there are two displays or projection screens, most designers will mount the camera between the screens at roughly the eye level of the people in the far-end image. That way people will perceive each other as looking toward their eye level, if somewhat to the side.

In rooms with one screen or a display that's always used as the main screen, it's best to center the camera below the image, as close to the image as possible. If the camera is above, when people look at the projection screen or display it will seem that they are looking down, which can be interpreted as a lack of interest. If the camera is below, on the other hand, they may appear to be looking slightly past those on the far end feed, but they will appear attentive.

Choose furniture carefully. It is possible to raise a camera high enough that it will have a clear line of site even with a traditional conference table, but that will cause problems with perceived eye contact. It's better to use a wedge-shaped table with the open end toward the camera.

Most often integrators will mount the video conferencing camera using a simple wall mount. If security or aesthetics are a concern, Draper offers a number of better mounting options.

For a dual-display or dual-projection screen environment, the Draper VCCB, or Video Conferencing Camera Box, places the camera in a steel box recessed into the wall between the images. A locking tempered glass front protects the camera from theft; the glass is angled to prevent any reflections from being visible to the camera.

For conference rooms where cameras will be placed below the monitor or projection screen, the Draper Credenza Camera Lift stores the camera in a piece of conference room furniture, then lifts it into place during the conference.

For rooms using projection screens, the Draper Ceiling Camera Lift is an elegant solution. Here the camera is stored in the ceiling in a case mounted behind the screen case. Lower the screen and the camera lowers to a position just below the screen.

Two-camera setups

In distance learning classrooms or conference rooms with a podium, it's necessary to mount a second camera toward the back of the room focused on the instructor or presenter. Many integrators will mount this camera on the back wall, but according to camera manufacturer Vaddio, PTZ cameras perform best in the middle of their zoom range, providing brighter images and smoother pan/tilt control when they do not need to be zoomed to either their longest telephoto or widest wide-angle setting.

The ideal position of this camera depends on its resolution and the size of the room, but in larger rooms it may be better to use a ceiling mount or lift to move the camera in closer than it would be with a wall mount.

Draper also makes an elegant product for these installations: a camera adaptor that fits the Draper AeroLift and Micro Projector ceiling lift lines. Since these lifts are available in drop distances to 48," installers can place the camera at the optimum location and optimum height in most rooms.

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About Don Kreski & Kreski Marketing

Don Kreski, president, has over 25 years in the industry, including almost 17 years as Marketing Manager for Midwest Visual Equipment Company (now a part of AVI Systems) and almost 7 years as Director of Marketing for United Visual, Inc. He is a member of InfoComm and a winner of NSCA's Movers and Shakers Award for his contributions to the industry.

Don works with a talented group of freelance writers, designers, photographers, videographers, researchers and programmers to offer you a complete package of marketing research, planning and creative services.

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Conclusion

If your organization is like many, you've learned that video conferencing can be a great substitute for travel, helping people catch the subtleties of meaning and intention that can easily be lost with voice-only connections. Yet to optimize communications, more than a great conferencing codec and camera is needed.

First, a clean, clutter-free background is essential, and it's especially important to eliminate movement that can destroy the quality of a high-definition connection using today's compression technology. A drop-down or pull-up backdrop, for example one of the neutral backgrounds available from Draper, can quickly and affordably create an environment optimized for video, even in a multi-purpose conference room or office.

The use of a printed background that includes the company name or logo and physical location can also provide these benefits and, in addition, be very helpful in identifying participants in multi-point calls.

Lighting is crucial as well, with the use of angled fluorescent video conferencing fixtures highly recommended, as they improve the quality of the captured image and make it easier to read the facial expressions of people at the far-end. It's also very important to eliminate color conflicts caused by mixed lighting. All fixtures must be of the same color temperature, with window light reduced or eliminated through the use of a shading system.

Finally, camera positioning is very important, with room designers most often placing the main camera either between dual screens or below the main screen, so that meeting participants perceive each other as actively engaged in the conversation. Draper offers a variety of camera mounts and lifts that can help you achieve the best possible camera position while enhancing the security and aesthetics of the room.

The implementation of these ideas will have a number of important benefits. Among them: the environment will look more professional, camera performance will be optimized, and meeting participants will be confident that they look their best. Meeting participants will be more relaxed and better able to see each other clearly – greatly helping the video call to simulate a face-to-face meeting.

CONTACT US

For more information on effective video conferencing visit Draper at www.draperinc.com/VideoConferencing